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ANNUAL REPORT

OF THE

Commissioner of Health

TO THE

GOVERNOR OF VIRGINIA

FOR THE

Year Ending September 30, 1912

Exchange Duplicate, L. C.

RICHMOND:
DAVIS BOTTOM, SUPERINTENDENT OF PUBLIC PRINTING
1912

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CONTENTS

LETTER OF TRANSMITTAL 5

GENERAL REPORT OF COMMISSIONER 6

Appendices.

I. REPORT OF THE BUREAU OF RURAL SANITATION 39
- Hookworm Disease 39
- Typhoid Fever 49

II. REPORT OF THE LABORATORY 54
- General Statistics 55
- Hampton Investigation 59

III. REPORT OF THE BUREAU OF PUBLICITY 71

IV. REPORT OF THE BUREAU OF INSPECTIONS 81

V. REPORT OF THE BUREAU OF SANITARY ENGINEERING 89
- Inspections and Surveys 92

VI. REPORT OF THE BUREAU OF VITAL STATISTICS 104

VII. REPORT OF THE RESIDENT PHYSICIAN OF THE CATAWBA SANATORIUM .. 106

VIII. GENERAL FINANCIAL SUMMARY AND DETAILED DISBURSEMENTS 131

IX. FINANCIAL STATEMENT OF THE CATAWBA SANATORIUM 132

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ANNUAL REPORT

OF THE

Commissioner of Health

Letter of Transmittal.

RICHMOND, *November* 15, 1912.

His Excellency, WILLIAM HODGES MANN,
Governor of Virginia.

SIR:

Herewith I have the honor of transmitting to your Excellency my report as Health Commissioner for the year ending September 30, 1912, together with appended reports of the various officers of the board.

In performing this duty, as prescribed by law, permit me to express to your Excellency my sincere appreciation of that wise counsel and sincere co-operation which the cause of public health has received at your hands. In all good work you have supported us and at all times you have been a valued counsellor. The cause which the Board of Health represents owes much to your Excellency.

I have the honor to remain, sir,

Very respectfully,

ENNION G. WILLIAMS,
Commissioner.

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General Report

Introduction.

Steady and consistent progress has marked the course of public health work during the fiscal year ending September 30, 1912. The Commonwealth has been blessed in that there have been no serious outbreaks of communicable disease and the people are to be congratulated in that they have begun to reap the fruits of past endeavor in sanitation. One great victory for better health has been won and advances in the war against other diseases have been made. Our people are more aroused than ever before to the importance of sanitation and are showing more interest in domestic hygiene than they have ever manifested in the past. More schools have been improved, more sanitary outbuildings have been erected, more model wells have been constructed, more towns have installed water supplies and sewage systems, more general interest has been shown in health publicity and more precautions have been taken in the average home than at any time during the history of health work in the Commonwealth. Aside from the successful enforcement of the new vital statistics law, and the very remarkable decrease in typhoid fever, both of which will be outlined in detail, this report will be found a simple chronicle of general progress, unmarked by signal victories, but unmarred by defeats.

RURAL SANITATION.

The peculiar emphasis placed by this department on rural sanitation is due to two specific causes, namely, the great predominance of rural population in Virginia and the lack of effective local health organization in the counties.

In addition, experience has shown that the country districts of the Commonwealth are more subject to certain diseases than are the cities, which diseases, as it happens, are those against which the most effective preventive work can be done. Typhoid fever and hookworm disease, in particular, are prevalent in many rural communities.

Investigations made in previous years have shaped our present campaign. We have found that, in addition to specific outbreaks due to local causes, much typhoid fever is scattered through the country and that, even where the disease does not exist, the conditions of life are such that typhoid may well appear at any time. In the same manner hookworm disease lessens the vitality of our population in many counties and may become seated even where it is not found.

These facts have made our campaign for rural sanitation fundamental in theory and elementary in application. While combating specific outbreaks, we cannot neglect the scattered cases. In reaching these cases we must improve general conditions that tend to breed or to carry disease.

This has carried us a step further. Typhoid fever and hookworm disease are filth borne and owe their very existence to the spread of human excrement.

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If all the excrement from all persons was disposed of in a safe and sanitary manner, both these diseases would be blotted out. Accordingly, our work in rural Virginia is largely the work of fostering proper methods of sewage disposal. As water is not available for sewage disposal in even one per cent. of rural homes, the end must be achieved by the construction and use of sanitary dry-closets. When there is a dry-closet on every farm in Virginia and in every home in every unsewered town and when these are used by all the people, then, and not until then, can we hope to successfully stamp out typhoid fever and hookworm disease. This is the deliberate judgment of the officers of the board after four years of active field work and this opinion cannot be overemphasized. Whatever else may be done to combat disease and to improve general health conditions in Virginia, the sanitary privy must be the objective of the chief activity.

This does not mean, however, that the universal use of the sanitary privy is the only need of rural Virginia. The lack of efficient health officers, bad ventilation of dwelling houses, the absence of medical facilities and bad water play a part in depriving our people of that good health to which, from the character of the climate and the nature of their occupation, they are so justly entitled. Of these, bad water is perhaps the most important. Experiments have shown, to be sure, that less typhoid fever is water-borne than was believed in the past, but actual experience in the State has demonstrated that a considerable percentage of our people are using wells and springs which may readily be contaminated. This condition is the more menacing when it is remembered that bad water does as much harm in lowering the general bodily resistance as in transmitting disease. In other words, where many of our citizens are subjecting themselves to the hazard of typhoid infection by drinking from insanitary wells, they are, at the same time, weakening their general powers of resistance, and consequently more susceptible to all diseases.

Again, in combating typhoid fever in Virginia, it has been necessary for us frankly to admit the limitations of our own knowledge and to extend that knowledge, by actual experiments and investigations, as rapidly as our means permit. Though a very old disease, typhoid fever was not scientifically investigated until the fact was established that it was a germ disease and filth borne. Even then practically all the investigations made were in foreign countries or in northern States and cities where climatic conditions were different from those of the southern States. Indeed, until this board began its work, practically nothing had been done in the south except the memorable investigations made by Levy and Freeman in Richmond. It was necessary for us, in a word, to ascertain whether or not the epidemiology of the disease is the same in the climate of Virginia as in northern States and, at the same time, to discover what methods of prevention are most efficient. This was a fundamental task, without which the investigation of outbreaks would be altogether fruitless of result.

These facts have been dwelt upon at length because they explain the nature of the campaign against typhoid conducted in Virginia during the last four years. Our plan has been (1) to investigate all reported outbreaks of typhoid fever, (2) to make investigations of endemic typhoid, (3) to agitate for the general improvement of sanitary condition in the counties

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and towns, and (4) to emphasize at all times the importance of the sanitary privy and the sanitary well.

(1) *Outbreaks Investigated.*—Previous reports of the board, and especially of the bureau of rural sanitation, will explain what has been done in investigating outbreaks since the board was reorganized in 1908. This work has been continued during the present year with gratifying results. No serious or general outbreaks have occurred in Virginia and most of those which were reported to us soon subsided when they were investigated. Indeed, the year has been rather memorable for the absence of serious epidemics—a condition to which reference will be made at a later point. Specific outbreaks are treated in detail in the appended report of the bureau of rural sanitation and need not be reviewed here except to emphasize a single point.

We have found that in some instances the lack of efficient local health organization renders impossible the prompt report of local outbreaks, and, in a few cases, we have not been called upon until too late to be of service. The relations between the State Board of Health on the one hand and the local boards on the other has been uniformly pleasant, yet closer co-operation is necessary in checking outbreaks of communicable disease. No community has the right to conceal the true situation or to trust to its own facilities alone when the safety of other communities is at stake. An outbreak of typhoid is, to be sure, a bad advertisement for a city, yet a local health officer will do his city infinitely more harm by concealing the facts and allowing the epidemic to run its course. The truth will inevitably be known and, generally, in the form of exaggerated rumors most prejudicial to the community. In making this statement the commission wishes, however, to emphasize the fact that failure to call on the epidemiologists of the board in case of outbreaks is generally due to lack of organization rather than to intentional neglect. In the vast majority of instances, moreover, the board has been called in as soon as the epidemic became in any wise serious.

(2) *Investigation of Endemic Typhoid.*—In some respects the investigation of endemic typhoid made during the past summer has been the most significant work done by the department. The assistant commissioner of health, a man of wide experience in this work, was detailed for this investigation and had assigned to him two assistants of experience, Drs. W. E. Bray and J. A. Waddell. In addition, Surgeon-General Blue, of the United States Health Service, detailed Surgeon L. L. Lumsden, M. D., to co-operate in the work. Through the courtesy of Dr. W. B. Foster, chief health officer of Roanoke, a laboratory was opened in that city, from which investigations were directed. Specimens of all sorts were collected from cases in nearby counties and were brought to Roanoke where they were subjected to various laboratory tests. The illness of the assistant commissioner, who was stricken just as the work was being completed, has prevented the completion of the report on these experiments, yet enough has been done to warrant the most sanguine expectations of valuable deductions. In a large measure the results were negative, but these may, in the end, be as valuable as if they were positive, since it is as important to prove that typhoid fever is not carried in a certain manner as it is to establish the fact that it may be communicated in other ways. The results of these investigations will soon be prepared and issued.

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(3) *General Sanitary Betterment.*—The agitation for a general sanitary improvement of rural and urban conditions has been carried on by the bureaus of rural sanitation, publicity, inspections and sanitary engineering, and will be found discussed in detail in the appended reports of these bureaus. In this connection, however, it is most gratifying to report an improvement in general sanitary conditions. It is not always easy exactly to point out the character of this improvement, but one need only take the average Virginian town and compare its sanitation today with conditions ten years ago to appreciate the change. Especially does this apply to methods of sewage disposal and to the installation of water supplies. Our Virginia people are often accused of an insurmountable conservatism that is gradually leaving them behind other States of the Union, but the falsity of this allegation is nowhere more clearly shown than in the improvement of sanitation in the small towns. It is perhaps possible to live without serious discomfort in an unsewered town and it is always more pleasant to spend municipal funds above ground, where the results may be seen and admired. Yet our people are fast realizing that the unseen town comforts, water supplies and sewerage systems, are the most valuable and the most desirable municipal improvements.

(4) *The Agitation for Sanitary Privies and Wells.*—In agitating specifically for sanitary privies and wells, all the officers and employees of the board have united. Realizing the overwhelming importance of the subject, the officers have a tacit agreement never to make a public speech and never to visit a locality but that they do something in this direction. Manifestly it is impossible to detail the exact extent of all that has been done in arousing our people along these lines, but a few of the many activities may be mentioned.

Through the kindness of our congressmen, we procured 50,000 franked copies of the very excellent "Farmers' Bulletin" on the construction and care of the sanitary privy (United States Department of Agriculture, Farmers' Bulletin No. 463). These we distributed broadcast to the farmers of the State and were thus enabled, without cost, to place these detailed and admirable suggestions where they will do the most good.

In like manner, we reprinted and distributed the Health Bulletin on the Sanitary Privy, approximately 100,000 copies of which have been sent to the citizens of Virginia during the last two years. The contents of this bulletin were likewise included in various other publications issued by the board so that they might be made accessible to all those who see the bulletin.

A model sanitary privy, on a small scale, constructed by the board, was exhibited on the farmers' industrial trains, where Dr. A. W. Freeman, of our staff, spoke daily to thousands of farmers.

The field inspectors of the board, paid by the Rockefeller Sanitary Commission, and investigating hookworm disease, keep a large supply of these bulletins on hand and explain to all whom they treat or address the importance of this privy.

In a word, "the gospel of the sanitary privy" has been preached wherever we have had opportunity with results that can best be reckoned in the large increase in the number of sanitary privies throughout the State.

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Precisely the same agitation has been kept up regarding sanitary wells with encouraging results.

These varied activities, we are glad to report, have not been fruitless. Virginia is reaping in a decreased typhoid rate what she has sown in public health work and in general education. The long expected harvest is being reaped. The following table will show the number of reported and estimated cases of typhoid fever in Virginia during the last three years ending September 30th, the estimates being made in the same manner for each year:

Year.	*Cases of Typhoid Reported.*	*Total Number of Cases Estimated.*
1909	7,442	14,398
1910	6,771	11,843
1911	5,959	11,803
1912	4,608	8,740

In other words, there was a yearly average of 12,681 cases for the three years 1909-1911, there were 8,740 cases in 1912; where there were 11,803 cases in 1911, there were 8,740 cases in 1912, or a decrease of 3,063 cases (29 per cent.). This is a profound source of gratitude to Providence and of congratulation to the people of the State. Some decrease, to be sure, is to be attributed to the mild summer of 1912 as compared with the extremely hot summer of 1911, but, as the best authorities reckon on a variation of only 20 per cent. between the best and the worst year, there has been a clear and unmistakable decrease in the average number of cases. The commissioner would attribute this decrease in part to the investigation of outbreaks and to the preventive measures taken where specific epidemics have menaced various communities, but he would attribute by far the greater part of the decrease to the better education of the people. In simple truth the people of Virginia know more about typhoid fever than ever before and, possessed of this knowledge, are better able to combat the disease.

To maintain this excellent record our people must not relax the vigilance shown during the past summer or neglect the precautions then taken. A return to insanitary methods of living will certainly be accompanied by an increase of typhoid. Neglect of a single precaution may bring the disease into a family; failure to care for the excrement from a single case may cause an epidemic. On the other hand, this record will be improved precisely as our people extend their knowledge and enlarge their precautions. If we have been able to thus reduce the rate by the exercise of the simplest precautions, we can hope tremendously to lower the number of cases by more elaborate and more general care. There is no reason why Virginia may not utterly stamp out typhoid fever with all that it means of suffering, of distress and of loss.

HOOKWORM DISEASE.

Second only to typhoid fever as a problem is rural sanitation and similar to it in many respects is hookworm disease. Since the memorable investigations of this disease by Stiles in 1901 investigations have shown its tremendous economic significance in the life of the south, its serious effect on the general

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welfare of our people and the methods by which it is spread. Abandoning the jesting unbelief of previous years, our people now appreciate that this disease, spread by insanitary methods of life is, in many parts of the south, the greatest handicap to progress and the most fruitful source of unhappiness. They are, therefore, prepared seriously to consider the disease and honestly to uphold efforts for its eradication.

Hookworm disease is spread by the eggs of the hookworm discharged from the bowel of persons suffering from the disease. Where these eggs are allowed to reach suitable soil they soon develop into larvae, which find entrance into the human body. Sometimes they reach the intestines with food or drink, but in a great majority of cases they find their way to the bowel by boring through the skin of the feet and coursing their track through the blood and at length into the stomach. The familiar ground-itch of childhood days is now known to be due to the hookworm larvae.

These elementary facts have been stated because, familiar as they are, they are essential to a proper understanding of the method by which the disease is combated. Persons may be treated for the disease by the simple drugs so efficiently employed for the purpose, but these persons may very readily be reinfected unless the excrement from all cases is disposed of in a manner to render it harmless. This is the whole philosophy of hookworm prevention and with it must go a propaganda for better living conditions which will give to every home a sanitary privy. We may treat hookworm disease until the end of time, but until we can arouse the self-respect of afflicted persons to the point where they will build and use sanitary outbuildings, our labor is in vain.

Three years ago the Rockefeller Sanitary Commission was endowed with $1,000,000 by Mr. John D. Rockefeller, of New York, and was chartered to organize a crusade against hookworm in all the southern States. Virginia had the honor of being the first State in which this work was done and Dr. Allen W. Freeman, the assistant commissioner of health, was designated by the commission as the first State director. Many of the campaign methods now employed in all the southern States were devised by Dr. Freeman in Virginia. Since the work was begun the commission has borne the expense of three field inspectors, who give their whole time to a general and local campaign against hookworm disease.

The work of these inspectors, with examinations made by local physicians in various parts of the Commonwealth, has shown that Virginia is not as heavily infected with hookworm disease as are some of the southern States and that the extreme infections are comparatively few in this State. At the same time they have found that perhaps 200,000, or ten per cent. of our total population suffer from some degree of infection—a discovery the importance of which cannot well be estimated.

How most effectually to reach these thousands, to treat them and to educate them in methods of prevention is the problem with which we have struggled since the inception of the work. The program which we have worked out is the result of experience and seems to us to be accomplishing the desired end. Our first work in a given county is to ascertain the presence or absence of the disease through specimens secured by physicians or by the local inspectors. This done, a campaign of education is at once in-

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augurated through newspaper articles, bulletins, special conferences and general lectures. An inspector is then sent into the county who makes a detailed investigation of the extent and distribution of the disease, upon the result of which the line of future work is determined. If the infection be severe, it is now our custom, with the support of the county, to open a dispensary, where diagnosis is made and treatments are given. If the infection be mild, our inspectors strive to enlist the support of practitioners and dispense treatments by mail. During the winter months, when it is impossible to hold dispensaries, our inspectors busy themselves with lectures, detailed surveys and school examinations. The last mentioned have been found very profitable and have resulted not only in the treatment of many hundred cases among children, but have furnished precise information as to the distribution of the disease.

The dispensary system, outlined above, was inaugurated this summer and is the last step in hookworm work in a county. It is our custom to open dispensaries only where the infection is severe or where there is a widely scattered, mild infection. Feeling, too, that these dispensaries cannot do their best work unless they are recognized as essentially a local and official activity, we have made it the rule not to open a dispensary until the county will make an appropriation for its support. Such an appropriation, generally of $100, does not cover more than twenty per cent. of the cost of the dispensary, but it sets the stamp of official approval on the enterprise and brings for treatment many who otherwise would be suspicious. During the past summer dispensaries have been held in Bedford, Franklin, Henry, Patrick, Essex and Gloucester counties, all of which, except Essex, made appropriations for the work.

Broadly speaking, our hookworm campaign has been productive of great good, not only in the notable reduction in the number of hookworm victims, but in creating solid sentiment for general sanitary betterment. The spectacle of helpless children and enfeebled men and women restored to vitality and to usefulness would of itself be ample reward for the arduous labors of this campaign. But where there is the additional assurance that the education of our people in the prevention of hookworm disease means better living conditions and improved general health, the joy of this service is greatly multiplied. We feel that nothing that has been done in Virginia for the health of our citizens has been more beneficial than this work in lightening the burden of our citizens, in bringing joy to thousands depressed and in giving hope to those in distress.

Before turning from this subject, the commission must express the profound appreciation of the board for the bounty and co-operation of the Rockefeller Sanitary Commission, and for its kindness of Dr. Wickliffe Rose, administrative secretary. During the last three years they have spent more than $30,000 in health work in Virginia, every dollar of which has been used to supplement the funds allowed by law. The history of the State does not record a single example where the health service has been so substantially benefited by private bounty. To Mr. Rockefeller and to the commission Virginia owes a debt of gratitude on this account!

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REGISTRATION OF BIRTHS AND DEATHS.

Second only to the marked decrease in typhoid fever as an advance during the past year has been the successful enforcement of the new law for the registration of all births and deaths in the Commonwealth. Prior to the last session of Assembly numerous attempts had been made to procure the passage of such a law, but the lack of general information as to the importance of such legislation foreordained these to failure. In the Assembly of 1912, however, a new bill was introduced by Senator P. H. Drewry, of Petersburg, who was kind enough to advise with the board as to the proper form of the measure. The board assisted him in every way possible and enlisted the services of the Federal Census Bureau as expert advisers. Through this co-operation a bill was drafted which was admirable in every respect, but which was somewhat weakened by amendments in the Senate. In its amended form, however, this bill received the approval of both houses and was signed by the Governor on March 14. The chief defects of the bill as finally adopted were: (1) Insufficient penalties for violation of the law, (2) the enumeration of local registrars not located to the best advantage, and (3) the limitation of the appropriation to $5,000 the year. Of the three, the last named was by far the most serious, in that it precluded the possibility of preliminary work by special employees of the board. Examination of the law likewise disclosed the fact that the cost of printing the necessary forms was charged against the appropriation made for administering the law. This reduced to a distressing minimum the amount that could be expended for the enforcement of the law.

With the consent of the board, the Commissioner named Dr. W. A. Plecker, of Elizabeth City county, as assistant registrar of vital statistics. Dr. Plecker had had experience in the collection of vital statistics while health officer for Hampton and Elizabeth City county and was, at the time of his appointment, field inspector for the bureau of rural sanitation. Other officers of the board did such preliminary work as was possible until Dr. Plecker was placed in charge on June 1.

The law became effective on June 14, from which date statistics have been compiled. To the conclusion of the fiscal year, therefore, statistics for three and one-half months have been procured, as follows:

Month.	*Deaths.*	*Births.*
June 14-30 (16 days)	1,052	1,817
July (31 days)	2,284	3,651
August (31 days)	2,286	4,034
September (30 days)	2,007	3,887

The credit for this admirable showing is due the people of the State, who were quick to see, when their attention was directed to it, how the law would operate to their advantage. As the publicity work done by the board, however, has been praised and copied in other States, it may not be improper to refer to the report of the bureau of publicity in which the method followed is outlined in detail.

We are glad to report that thus far it has not been necessary to enforce the penalty clauses of the vital statistics act. Numerous complaints have

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been made that undertakers, physicians and midwives were violating the law, but all of these, upon investigation, were found to rest upon unsatisfactory evidence. We do not pretend that there have not been violations of this law, some of which may have been intentional; but we have felt that where public sentiment was forming rapidly in behalf of the law, the proper course to pursue was one of conciliation and diplomacy. Had we been apprised of wilful violations of the law, with evidence sufficient to warrant prosecutions, we should at once have prosecuted, but where there were only vague charges and indefinite evidence, we have preferred to appeal to the patriotism and good sense of the people for the enforcement of the law. The results have fully justified this course.

The limited funds at the disposal of the department for the enforcement of this law have prevented any detailed study of the death certificates filed. Yet these will undoubtedly yield information of the greatest possible value to social and health work in the Commonwealth. These advantages are discussed in detail in the bulletin issued by the board and entitled "Why Births and Deaths Are Recorded in Virginia," but the particular importance of certain of them may be given a word of attention here.

The value of accurate information as to the mortality from and the location of given diseases is too obvious to need discussion. Without this information much energy must be misdirected where it is not actually wasted; with this information we can more intelligently proceed to the solution of health problems as they present themselves.

The demographical importance of such statistics, however, is no less great, and is of immediate bearing in view of the manifest loss of population in certain parts of the State. With an accurate report of all births and deaths in a given county, it is obviously possible to balance the books of life and to ascertain whether there is an excess of deaths over births or whether the decrease is due to removals. In either case, remedial action can be taken along practical lines. In precisely the same manner we can proceed to an intelligent discussion of the negro problem as soon as we have tabulated statistics, showing exactly how death and disease are affecting this race. Indeed, there is scarcely a great social problem upon the solution of which vital statistics will not throw valuable light, altogether apart from the importance of such statistics to the law and to public health.

In this connection, merited praise should be given the medical profession of the State who have, with but few exceptions, supported the enforcement of the law. Appreciative of its benefits to their patients, they have, without remuneration of any sort, furnished the necessary statistical information and have co-operated with the local registrars. The funeral directors and midwives have also co-operated admirably, while the local registrars have shown themselves most zealous in the discharge of their duties.

Effectually to complete the work so hopefully begun, the board must have a more liberal appropriation for this work. To collect and to file the certificates, as is done at present, will not suffice. We must have sufficient clerical help regularly to tabulate and to issue for public information the data to be gathered from these certificates. The law will not accomplish the maximum good until the appropriation for its enforcement is doubled.

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THE CATAWBA SANATORIUM.

During the past year advances have been made at the Catawba Sanatorium which indicate admirable progress in the State's campaign against tuberculosis. The staff has been slightly enlarged, new facilities have been given for work, new buildings are under construction, every bed is filled and a long waiting-list is clamoring for admission.

With characteristic appreciation of the needs of the work against consumption, the General Assembly of 1912 made liberal allowance for Catawba. For maintenance during 1912, $45,000 was appropriated, with $50,000 for betterments. For 1913, $50,000 was appropriated for maintenance. These appropriations were made upon representation by the board that the work at Catawba could not be carried on to the best advantage without certain specific betterments, a list of which was prepared in December and was submitted to the General Assembly. At the time we asked the finance committee to incorporate these appropriations in the general appropriation bill the expenditures then proposed seemed best.

In a few weeks, however, the board was called upon to make a very delicate choice.

During the summer and fall months of 1911 there had been a noticeable decrease in the number of persons suffering from truly incipient tuberculosis and applying for admission to the sanatorium. It was impossible to fill the sanatorium with those cases whose condition would render treatment easy and recovery prompt. There were thousands of such cases in the State, yet, as it happened, comparatively few true incipients wanted treatment. Not educated as to the necessity of early treatment, they did not wish to enter the institution unless their condition grew worse. As every vacant bed meant loss to the State and as thousands of moderately advanced cases were dying for lack of sanatorium treatment, we admitted the latter class. During the fall and early winter and until after the Assembly met these patients did well; but during the rigorous months of February and March they suffered severely. The open pavilions at Catawba, so admirable for incipients, did not give to advanced patients the protection they needed. Better and less exposed buildings were necessary before the advent of another winter. This was a solemn truth we could not neglect.

Furthermore, we were having difficulty in getting precise information as to the condition of patients before they arrived at Catawba. The diagnosis of incipient tuberculosis is often very difficult and is not, unfortunately, familiar to some practitioners. In consequence, the board's representatives at Catawba would receive the application of a patient described as "incipient" only to find, when the patient arrived, that he was "advanced." Catawba is admirably located for the treatment of incipients and was never intended to be used by other patients. When, however, advanced cases were required to make a trip that would not affect incipients they often suffered from the journey. Manifestly, the State needed some institution nearer the railroad where all patients could be received and where the doubtful cases could carefully be diagnosed before they were subjected to the trip to Catawba. With the experience of the winter before us, the conclusion was inevitable: a reception hospital must be built near enough to the sanatorium to utilize the officers

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of that institution, but nearer enough likewise to the railroad to be accessible to all patients desiring either diagnosis or treatment.

Had the lessons of the winter been impressed upon us when the Assembly met, the board would have felt no embarrassment. It would have asked for a reception hospital rather than for improvements at Catawba. Acting, however, on the best information available at the time, the board had received a large trust fund upon the representation that the money would be devoted to specific work. Thus the board was in a predicament; either it would be compelled to leave undone what new evidence showed us must be done, or we would seem to have been careless in the statement of our case before the General Assembly. But between the alternatives of properly protecting the State's patients and being ourselves criticised, there was no choice. By unanimous vote the board decided to build a reception hospital on a suitable site, which hospital could fulfil several most desirable functions. It could be used for the reception of all patients desiring admission to Catawba; it could be used to give general treatment to incipient cases before they were sent to Catawba; it would afford accomodations for advanced cases who would not take the open-air treatment at Catawba.

In pursuance of instructions from the board, the Commissioner negotiated the purchase of a splendid tract on Mason's creek, near Salem, for a total of $3,275. Architects were then asked to submit plans for a suitable reception hospital to be built on this site. Various designs were submitted, the best of which, in the board's judgment, was that proposed by Charles M. Robinson, Inc., of Richmond. The contract was awarded accordingly.

But before bids could be asked, the Auditor of Public Accounts raised a question as to whether or not the appropriation for "Betterments, Catawba Sanatorium" would cover the building of a reception hospital at the site purchased. Upon reference to the Attorney General it was decided that the appropriation could not be so construed and that the money spent for land must be returned. As the board had ample authority under the act creating it to purchase land and to build sanatoria, the amount expended for the tract near Salem was drawn from the general account of the board and placed to the credit of the "Betterment Account." This arrangement was approved in due season by the Auditor.

This settlement left in the possession of the board the valuable site at Salem and makes possible the erection of a reception hospital at some future time. The board believes with the Commissioner that application for funds with which to erect this hospital should be made at the next session of Assembly and regards this plan as the most valuable single thing that can be done for the cause of tuberculosis in Virginia.

The question may be asked why did the board proceed with the improvements originally planned when it found itself unable to build the reception hospital, which it regarded as a more pressing need. To this the answer is plain. The need of a reception hospital did not lessen the need of improvements at Catawba and the board only decided against the latter in the first instance, because it felt a reception hospital more imperatively necessary. When the greater need could not be met, the lesser became greater.

Indeed, the expenditure of the authorized appropriation in needed improvements at Catawba places the board where it will have a more urgent need

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for a reception hospital. These improvements are proceeding along the lines presented to the General Assembly and will be completed during the present winter. They will not, to be sure, afford ideal quarters for advanced cases, but they will give greater conveniences to all cases and will render less rigorous to even the sickest patients the rough winter months. At the same time every effort that can be put forth is being expended to educate physicians in the diagnosis of tuberculosis and all possible means are being taken to bring incipient cases to the sanatorium.

The improvements at the Catawba Sanatorium will include the erection of an infirmary building, a necessary enlargement of the kitchen, the installation of electric lights, extension of water supply, the improvement of the roads around Catawba and small improvements in the old hotel building, now used for nurses. This will give to Catawba a capacity of more than 150 and will make more efficient in every way the treatment administered there.

During the past year few changes in the staff at Catawba have been made. Dr. C. R. Woolwine, first assistant resident physician, tendered his resignation on August 23, to engage in private practice, and in his place was appointed Dr. B. L. Taliaferro, of Richmond. In addition, by action of the board on July 10, a second assistant resident physician was appointed in the person of Dr. R. P. Stryker.

The first class of nurses to be graduates from the nurses' training school received their diplomas on June 3d. These were Mrs. Leslie G. Barnett, Mrs. Mary K. Page, Miss M. Essie Wells and Miss Bessie T. Fleming, all of whom had done excellent work at the sanatorium. They carried with them the best wishes of the sanatorium staff and of the board. Laboring earnestly amid hardships, they deserve the success that will certainly be theirs.

The report of the resident physician of the Catawba Sanatorium, appended to this report, shows that in those cases of tuberculosis which the Commonwealth has been able to treat, most satisfactory results have been attained. Our theories as to the treatment of tuberculosis, it must be recalled, are quite recent and are still, so to speak, upon trial. Within the last few years many details of the treatment have been changed and the ultimate effect of any method is still to be judged. Indeed, of only one thing we are sure, namely, that the open-air life is the only known method of curing tuberculosis. How best to administer this treatment is a problem on which constantly there is new evidence.

In spite of these facts, the treatment at Catawba, as shown in the statistical tables of the resident physician's report, has been eminently successful. The patients have shown a greater gain in weight than at any time during the history of the institution and there has been a steady and marked improvement in the condition of many admitted to the sanatorium. As the facilities at Catawba are improved we may hope to see bettered the present gratifying showing.

As Catawba represents the State's concrete efforts against tuberculosis, this disease may properly be discussed in this connection. Our morbidity statistics show the following reported and estimated number of new cases of tuberculosis during the year 1909-1912, inclusive:

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Year.	*Cases Reported.*	*Cases Estimated.*
1909	6,816	12,127
1910	5,760	10,545
1911	4,494	8,651
1912	4,803	8,681

There is thus apparent a slight increase in the number of new cases of tuberculosis reported during the past year, as compared with the preceding year (1910-11); yet there is a marked decrease as compared with four years ago. This is precisely what might be expected under normal conditions, for the number of new cases will vary from year to year and progress is to be measured from a study of statistics for a number of years. Yet we would not be understood as saying that this condition presages the speedy conquest of tuberculosis in Virginia. On the contrary, with a tremendous negro population and with poverty in our midst, forcing upon our people a low and insanitary standard of life, tuberculosis remains the greatest menace to the prosperity and happiness of our State.

But altogether apart from these statistics and the lessons to be drawn therefrom, there are at least four great and pressing needs of tuberculosis work in Virginia. First among these is the necessity of some provision for treating the colored consumptives of the State. As the matter stands today, the race which suffers most severely from tuberculosis is the one for whose treatment absolutely no arrangements are made. Indeed, the only negroes who may expect treatment for tuberculosis are the insane and the criminal, who are cared for at public institutions. Humanity and foresight alike demand that this neglect be remedied. Our negroes are citizens of a more or less dependent class, for whose needs the guardians of the public weal are responsible. In addition, as a servant class, they come in intimate contact with the white race and frequently spread consumption among those whom they serve. The State cannot neglect them or fail longer to make provision for treating at least a certain percentage of the afflicted. More urgent representations will be made at the next session of Assembly.

The second need is for more active anti-tuberculosis work on the part of our municipalities. With not less than 25,000 consumptives in the State, at least fifty per cent. of whom cannot afford treatment at their own expense, the State cannot begin to meet the wants of those who have the disease. If even a reasonable percentage of sufferers are to be given treatment, all the forces of government and philanthropy must be enlisted. This means that the cities and towns not less than the State must offer treatment for their indigent consumptives. At present pitifully little is done. Richmond and Petersburg have tuberculosis sanatoria supported by private means and by city funds; Roanoke, Lynchburg and Charlottesville have limited facilities, but with these the list is practically complete. The State should do all in its power to arouse the localities to an appreciation of their responsibility in this direction. Where sanatoria cannot be provided, a system of dispensaries and of visiting nurses, along the lines approved by the State Anti-Tuberculosis Association, should certainly be installed.

The next need is that of better education in the diagnosis of tuberculosis. As has already been pointed out, the applications for admission to Catawba

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furnish a very good index to this need. In spite of the fact that the sanatorium is known to be for incipient cases, physicians send patients to the sanatorium who are in advanced stages of the disease, yet are certified in the application to be incipient. What is true of the Catawba applications is true of conditions generally. Nor is this a reflection upon the medical profession of the State, who, man for man, will rank with the physicians of any State. The truth rather is that the diagnosis of tuberculosis in its early stages is often a matter of extreme difficulty and can only be done by men carefully trained and constantly in practice. Yet, when it be recalled that upon the early diagnosis of the disease depends successful treatment, the need of facilities for such diagnosis are obvious. As far as possible the sanatorium has prospective patients in the various centers of population diagnosed by physicians familiar with the disease, but even this does not afford accurate diagnosis to many incipient sufferers. A solution of the problem is not yet in sight, but the need of some more approved system is indisputable.

Finally, the need of private tuberculosis sanatoria is daily evident. The many applications and the long waiting-list at Catawba, the frequent inquiries to the office of the board and like inquiries to the State Anti-Tuberculosis Association show that scores of persons in the State suffering from advanced tuberculosis are aroused to the need of out-of-door treatment and are anxious to enter private institutions.

At present there is but one private tuberculosis sanatorium in Virginia, located adjacent to the Catawba Sanatorium operated by Mrs. Leslie G. Barnett and called Mountain View Sanatorium. Soon after the State sanatorium was opened and while its accommodations were very limited, Mrs. Barnett agreed to board one patient on the waiting-list of the sanatorium, and she has gradually increased her capacity until she now has quarters for thirty patients. Realizing the tremendous need of such an institution, we have done all in our power to encourage it. As there was no physician within ten miles of Mountain View, Mrs. Barnett's sanatorium, we authorized one of the resident physicians at Catawba to attend patients at that institution during his hours of recreation, upon terms agreed upon between him and Mrs. Barnett. Mountain View, however, has now been so enlarged that it employs its own resident physician and is in nowise dependent upon Catawba.

We gladly commend this institution as conducted according to the best approved theories of treatment. We could but wish that like sanatoria were established in the mountains of Virginia. Our climate is well-nigh ideal for the treatment of tuberculosis and in our mountains can be found sites rivaling in restful beauty and inspiring grandeur the most famous health resorts of this country. There is a splendid opportunity open for the treatment of tuberculosis in Virginia.

The board wishes, in concluding this subject, to acknowledge the hearty co-operation of the State Anti-Tuberculosis Association which has joined hands with us in our effort to combat the white plague in Virginia. Among the conserving forces of the Commonwealth this association will take high rank.

WORK OF THE LABORATORY.

The past year has been marked by noticeable advances in the work of our laboratory. Larger quarters were fitted up on the second floor of the building

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used by the board, which quarters gave ample facilities for this important part of our activity. In addition, during the busy months, funds were available for the salary of an assistant to the bacteriologist.

The tabulated report of the laboratory appended will show an increase of thirty per cent. in the general microscopic investigation made and an increase of almost one hundred per cent. in the specimens examined for hookworm disease.

Most remarkable has been the increase in the number of persons given the anti-rabic treatment during the last year. Owing to the prevalence of rabies among the animals of the State and to the inability of many persons to pay the prices charged by the Pasteur institutes, the board in 1909 made arrangements whereby it was enabled to treat indigent persons bitten by rabid animals. The virus for this purpose was furnished by the United States Public Health Service without cost to the department and the injections have been made by the bacteriologist of the board. During the past year the number of persons so treated has been ninety-four, without fatality or serious sickness. As the lowest rates at the Pasteur institutes are $100, the saving to the afflicted persons was at least $9,400, to say nothing of the fact that all were successfully treated where some might have neglected treatment and lost their lives.

While the board rejoices that the bounty of the State has enabled these sufferers to find treatment, we must observe that the present policy of allowing animals to go at large without muzzles should at once be changed. In addition to the expenses to those persons bitten by rabid animals, the State annually loses a vast sum in the money-value of horses and other valuable animals killed because they have been bitten by rabid dogs. Besides all this, our records show that two persons died in the State during the last year from hydrophobia contracted from rabid animals. The total suffering and loss constitute an impressive indictment of our carelessness. Precautions can and must be taken in cities. At least during the summer months all animals should be muzzled, while in the country districts all dogs and like animals should be securely tied when they show the first signs of sickness. These precautions are taken in practically all European countries and they suffice to give complete protection from rabies. We should emulate the foresight of our foreign neighbors.

Speaking generally of the work of the laboratory, it is a pleasure to report that we are now fully equipped to meet all reasonable demands of the physicians of the State in the diagnosis of typhoid fever, malaria, tuberculosis, diphtheria and hookworm diseases and in the sanitary examination of water. We are making every effort to acquaint every physician with the uses of our laboratory and are constantly inviting them to send specimens.

Hampton Creek Investigation.

The most elaborate experiments carried on by the laboratory during the past year were those conducted with the bureau of sanitary engineering regarding the purification of sewage in Hampton creek and adjacent waters. The topography of the country adjacent to the cities of Hampton and Newport News renders the waters of that locality peculiarly susceptible to pollution from crude sewage. In addition, many valuable industries located along the

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waterfront have suffered severely from the pollution of the water. Our investigation was to determine to what extent the sewage from nearby communities might be purified.

The results of this investigation are appended to the report of the laboratory and furnish much valuable information regarding the feasibility of disinfection when properly done. Our investigators recommended that all sewage from the Salter's creek outlet, from the district between Salter's creek and Hampton and the sewage from Hampton, from Phoebus, from the Hampton Normal and Agricultural Institute and from the National Soldiers' Home be disinfected by the addition of from ten to fifteen parts per million of available chlorine. They were of opinion that if this disinfection were done under the direction of a trained man, it would render the waters much less dangerous.

SANITARY INSPECTIONS OF THE YEAR.

The report of our director of inspections, appended hereto, will explain in detail the inspection work of the last year. The hotel inspection has been done exclusively by Dr. Flannagan, director of the bureau of inspections, while the general sanitary inspection work has been done by him and by the other officers of the board.

Beyond question, the hotel inspection has done much good in procuring for the traveling public sanitary accomodations and a reasonable protection from communicable disease. During the past summer, to correct an omission in the hotel law, the board issued two special hotel regulations, one requiring the kitchens of all hotels to be screened from flies and other pests, the other requiring all wells and springs supplying hotels to be walled and drained in a sanitary manner. These two regulations, we expect, will be the means of still further improvements in the sanitation of hotels.

In past years summer resorts have repeatedly been under suspicion. City health officers frequently alleged that residents of their communities, spending the summer months at rural resorts, returned with typhoid fever. Apart from these complaints, the justice of which need not be discussed here, it was generally recognized that some of our summer resorts were certainly careless in protecting the health of their guests. Accordingly, during the present summer, our inspector has held these resorts to a strict compliance with the law and reports that conditions there are better than at any time since the bureau was established.

A rather striking incident of our hotel inspection has been the lack of complaints regarding insanitary conditions. With but one man employed at this work, the board has been unable to visit hotels more than once a year, and while the inspector has carefully abstained from any previous announcement of his coming, once his inspection is made, he is not expected again for a year. In consequence, unscrupulous hotel proprietors may relax their zeal and may allow insanitary conditions to arise. To prevent this our board has frequently called upon the traveling public and, in particular, upon the great commercial organizations, to co-operate with us in enforcing the law and in reporting violations. In this way we expected to have evidence wherewith to require correction or to institute prosecutions as the occasion demanded. Yet, despite our efforts, since the bureau was established, only three complaints

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have been received from private individuals. The board wishes to reiterate its request for co-operation and assures all complainants that their communications will receive prompt attention.

In justice to the hotel proprietors of the State, it is but just to observe that they have given us, in the main, their heartiest co-operation. A few there are, of course, who have no higher aim than that of being permitted to operate; but the vast majority seem honestly anxious to do their utmost in conforming to the law. Where they have been found derelict, we have been able to accomplish the necessary reforms by a simple reminder.

General Inspection Work.

Our custom is, whenever an officer of the board is in a section of the State where health organization is not effective, to have him do his best in aiding the local authorities. Accordingly, during the course of a year, many hundred inspections are made. As has already been indicated, the results of these show a marked improvement in sanitation throughout the Commonwealth. Our people are paying more attention to public health, are more alive to its possibilities and are appropriating more of the public funds to the prevention of disease and discomfort.

Yet our investigations have shown us that much remains to be done and that many problems are still to be solved. Foremost among these is how best to provide for local health organization. In the past, it will be recalled, the Commonwealth has left this entirely to the counties and towns which made such appropriations as they thought best for public health work. A recent act of Assembly (1910) placed the appointment of the local boards in the hands of the State board and authorized the board, where a town failed to appoint a board of health, or had no provision therefor in its charter, to name such a board. While the principle here invoked is a wise one, it has not been sufficient to secure effective local health organization in many counties. We can appoint local boards and strive, in every instance, to name for those positions the best men who will accept, but we are unable to assure them of any reasonable return for their labors. Apparently none of the counties feel able to pay a physician for his whole time as health officer and, in consequence, they must have boards made up of regular physicians who give part of their time to this work and who receive little for their labor. In theory this seems a fair solution of a problem, but in practice it is subject to several objections, some of which may not be obvious. In the first instance the average physician who does health work inevitably renders himself unpopular with a certain element of the public, and in some cases becomes involved in unpleasantness with other physicians. Where, therefore, there is no reasonable financial return for the health work done, we are forced, in some instances, to appoint physicians to places, the acceptance of which means financial sacrifice on their part. On the other hand, it is not easy to say precisely what a given county should pay its health officers. *Every such officer has to demonstrate the work of his services to the county before he can expect proper compensation.* To say in advance that any man should be paid a stipulated amount for services to be performed, where the nature and extent of those services is uncertain, is manifestly unreasonable. Thus the State board is embarrassed from either point of view. Our policy has been to state to all inquirers the facts as they

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are and to urge ill-paid members of local boards to demonstrate to the counties what their services will do in the prevention of disease, relying upon the justice of the supervisors for proper compensation.

Yet we despair of effective results under the present system and are inclined to doubt that the best results can ever be had from a local board made up of busy and overworked physicians, all of whom must spare time from their practice for public health work. Even where they are equipped, they are circumscribed and hurried in many instances and can neither do justice to themselves or to the county. While the time is perhaps not yet ripe for any material change, we believe that a new system must be introduced and that contiguous counties must join in the payment of a competent health officer who can give his whole time to the work.

In the smaller towns and cities the situation is but little less complicated. The council can seldom appropriate sufficient funds to procure the whole time of a competent physician and is forced to rely upon the same form of organization employed in the counties. This, as has been shown, is subject to serious objections and can seldom be made efficient. The personal and financial sacrifices which a regular practitioner must make while serving as health officer a part of his time are rendered greater as his field of activity is limited and as his contact with the patients of other physicians becomes closer. *Numerous cases are of record where practicing physicians, doing health work in a town, have ruined their own practice and have brought on themselves the criticism of their professional colleagues.*

In such cases, where a physician cannot give his whole time to the work and where a health board cannot be made efficient, we are inclined to believe that the best form of organization is to have an advisory board of physicians, or physicians and laymen, directing the work of a sanitary inspector who need not be a practitioner of medicine. Such an inspector, if he be diligent and intelligent, can become very proficient in the routine health work, and, if he be advised regarding technical matters by a competent board, can do most of the work that would be done by a regular health officer. The diagnosis of contagious diseases, the injection of antitoxin and bacteriological examinations must, of course, be made by some one trained for that work, but in the inspection of premises, the abatement of nuisances, the enforcement of quarantine, the fumigation of premises and like matters, an inspector can soon learn to discharge the duties as well as any one. As the cost is much less and as the question of professional ethics does not arise, two of the greatest objections to the old system are thus obviated.

In presenting this plan for small towns, however, we would not be understood as saying that a lay health officer is as desirable or as efficient as a regular practitioner. Where the town can afford it, a trained health officer is the best possible municipal investment and will perform more valuable service for the same salary than any officer who can be employed. Where a town cannot afford a regular physician as health officer, giving his whole time to the work, a sanitary inspector is the best substitute.

The difficulties presented by the present inefficient system are well illustrated in the abortive attempts made to control smallpox in some of our counties and towns. As is well known, smallpox constitutes a problem of no small dimensions in Virginia. That general immunity which the State received as a

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result of the universal vaccination of war times has about passed. In its place our people have done little, either by statute or by custom, to protect themselves by vaccination from the ravages of this disease. Even the very necessary law for the vaccination of all children of school age is weakened and vitiated by a section allowing the school trustees of any county to waive the requirement when they think best. The result of all this is the annual appearance of smallpox in many counties of the State, with consequent heavy expense to the counties, destruction of property and loss to individuals. To complicate the situation, much of this smallpox is of a mild type, readily mistaken for chickenpox and sometimes difficult definitely to diagnose.

So great is the puble's inherited dread of smallpox that one might expect the most diligent efforts would be made to stamp out this disease at its first appearance. Here, if anywhere, one would suppose the present system of local health organization to be effective. As a matter of fact, in some instances, confusion is worse confounded. There is constant dispute among members of the board and practicing physicians as to the diagnosis; there is seldom effective quarantine; general vaccination is often neglected. Sometimes it happens that the supervisors refuse to authorize vaccination and decline to pay the bills contracted by members of the board for vaccine virus. Even where the counties are diligent, the system adopted is one of the most expensive and inefficient that could be devised.

A single case in point will illustrate the situation. In September of the present year our board was notified that smallpox had appeared in a certain county and that no precautions were being taken to stamp out the disease. Members of the local board of health declined to vaccinate because their bills for services rendered in previous outbreaks had been scaled by the supervisors. The chairman of the supervisors, when interviewed by a representative of the board, declined to approve vaccination. To protect the citizens of the community the board had to invoke the law authorizing us to assume control of the situation where the local authorities refused to act. We had to send the director of inspections to the country in question, where personally he directed vaccination. It is even doubtful that he would have met with success had he not been accompanied by a magistrate whom he instructed to issue warrants for every man who refused to be vaccinated.

The inefficiency of the old system, so graphically illustrated in this case, is witnessed in practically every serious outbreak of disease occurring in a very large part of the State. Indeed, so serious is this situation and so disastrous may be its results that we regard a reform of the system of local organization as the most pressing need of health work in Virginia. In the very place where our system should be most efficient it is weakest.

This does not mean, however, that the men who constitute our local boards of health are either incompetent or inefficient. They are precisely the contrary in a majority of all cases. Able, conscientious, self-sacrificing and overworked; the fault is not with them, but with the system. The great source of regret is that these men have not the means and the time to do the work of which they are capable. Under a different system and better supported by the counties, many of them might be expected to make their communities models of good health and sanitation.

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The Training of Health Officers.

Before passing from this subject, we wish to call attention to the training of health officers. The able men, to whose unselfish labors we have just referred, are often handicapped by the lack of laboratory facilities and technical training in the more complex aspects of public health work. While our laboratory is always at their disposal, and while we are willing to help them in every way possible, we cannot, in the very nature of things, give them all that they both need and desire. We must look to the medical schools to emphasize the possibilities of preventive medicine and to give to their graduates and students courses that will meet the demands of the day. Preventive medicine is the leading science of the future and will in time largely supplant curative treatment. Physicians will cease to devote their entire time to curing disease and will do their noblest service for mankind in preventing sickness. Fortunate is that physician who can foresee his line of future work and prepare himself adequately for it.

SANITARY ENGINEERING—GENERAL WORK.

Two years ago, it will be recalled, the board authorized the appointment of a sanitary engineer. This was to meet an existing need and to anticipate an important line of health development. Blessed with many numerous watercourses and not suffering from overpopulation, stream pollution has not yet become a menace to Virginia except in a few isolated cases. Yet, as our cities increase in size and number, we may expect this to become a serious problem. While there is yet time, the State must be mapping out preventive work. Again, the disposal of sewage in our small towns and cities has become a matter of immediate concern, as many of these places are still dependent upon open privies and wells and are fruitful fields for typhoid infection. Realizing this, many of them have been planning the installation of water works and sewerage systems, with which to combat disease and to increase comfort. Obviously the State should be able to give to these communities expert advice as to the proper lines of advance and should protect them from costly errors.

These were the reasons which prompted the board to appoint a sanitary engineer as soon as funds were available. That their course was wise and that the work of such an officer is valuable, is shown from the report of the engineer appended hereto.

A large part of our engineer's time has been devoted to a sanitary survey of the State, the purpose of which was to ascertain the precise facts as to the water supplies and sewerage systems of all the towns and cities of the State. This has progressed to the point where we have available data regarding practically all of the cities and towns. This must be subjected to careful scrutiny and must be studied in the light of the census and the movements of our population. Some of our towns which are to be the centers of busy industries appreciate their responsibility and are preparing for the future; other towns, as well located and as promising, are losing a great opportunity in failing to provide themselves with good water and good sewers. Again, when this survey is complete, it will show where we may look for serious pollution and will indicate the line of work to be followed in protecting those

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of our citizens who live along watercourses from the carelessness and neglect of their neighbors up-stream.

In the same way our engineer has been in constant demand as an advisor to localities and institutions preparing to install new water and sewerage systems. We are glad to report, on the authority of his investigations, that most of this work is progressing along satisfactory lines. We wish to point out, however, the extreme importance of competent engineering in those towns which plan new or enlarged systems. Our towns are not building for the present population only. They are not laboring for this generation alone. The work that they do is to be for all time and should serve the localities a hundred years hence. For this reason it is extremely important that all the work done should be laid out according to the best advice of the time, with a view to future enlargements. To facilitate this and to prevent costly errors we would urge all towns and cities planning new systems or enlargements of existing systems to consult the board before taking action. We are prepared to meet such demands and believe that this consultation will be beneficial to the localities interested.

Sewage Disposal in Private Homes.

The growing prosperity of our people has been marked by an increased desire on the part of our country citizens to install systems of sewage disposal in their private homes. This commendable move is approved alike for sanitation and for comfort and should be encouraged as fast as the means of our citizens will permit. The board is most anxious to aid in this work and has prepared a number of plans for plants that can be installed in suitable soil at a comparatively small cost. We are still at work along the same lines and are anxious to co-operate with all who are experimenting in this field. Especially are we desirous of having data regarding the installation of such plants, together with information as to their success. The varied character of our soil prevents the universal use of a single type of sewage disposal plant, but as these plants are tested in different parts of the State we anticipate the speedy construction of sufficient models to serve for each type of soil.

PUBLICITY AND EDUCATION.

Turning now to what is, in our judgment, the most important single aspect of our work, we are glad to report that our educational and publicity work has been marked with new success during the year just ended. To explain the nature of this success and to describe the lines we have followed must involve a brief discussion of certain conflicting theories of public health work.

There are those who contend that public health activity should be purely professional. Such men regard sanitation as a strict science which should only be practiced by those technically trained. They would confine all health work to professional men and deny that the public can ever be trained to take precautions or to exemplify sanitary truth. The test-tube and the miscroscope are the chief instruments of this class of sanitarians, whose field is not the world, but the laboratory.

Another field of sanitarians believe that propaganda along the lines of cleanliness and pure food is all that is necessary. These men do not in every instance deny the value of scientific work, but they are inclined to place their

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chief emphasis on popular activity. To clean a filthy kitchen and sweep a street seems to them as important as to investigate an epidemic or to purify a water supply.

While not wishing to reflect upon either of these methods, we have rejected both in our work in Virginia. We have proceeded upon the principle that sanitation means combined science and common-sense and that it requires alike scientific investigation and popular education, both of which must be directed to feasible, practical ends.

Accordingly, we have done such scientific work as we have thought of real and practical value to the people of Virginia. As far as our force and ability permitted, we have investigated the outbreaks of disease, we have studied the water supplies of our people, we have given laboratory diagnosis to certain diseases, we have treated hookworm disease, and we have studied epidemic typhoid both in the field and in the laboratory. We have distributed antitoxin to the medical profession and we have treated rabies. We have directed vaccination and we have investigated special diseases. But when we have done this, we have felt that our work, however practical and however scientific, was but half completed. Our chief reliance has been upon the common-sense and intelligence of our people, whom we believe capable of applying to the conditions of daily life the tested truths of science. *We have felt that preventable disease was the offspring of ignorance and misinformation and we have believed that precisely as education advanced, so disease would be lessened. Sanitary science is no mystery, the solution of which is given to the elect. It is no fine-spun theory, useful only to its enlightened devotees. It is common-sense put to practical ends and based on accurate science.*

Education, then, has been our great end. After doing this accurate scientific work necessary to combat disease, our problem is how to inform the people of the results in order that all of them, regardless of estate or condition, may apply the truth to daily life.

Our educational work has been along four general lines, namely (1) simple newspaper publicity for the information of the masses, (2) popular publications along simple lines, distributed as widely as possible, (3) general lectures and exhibits suited to popular audiences of all classes, and (4) special, technical lectures in scientific subjects, delivered to professional audiences.

The report of our publicity bureau, appended hereto, will explain in detail the various work done along these lines and will repay a careful reading. It may not be inapropos to say here that the success of this work is, in our judgment, the largest single factor in the decrease of typhoid fever and in the general improvement of rural sanitation.

To cite a single instance, the following publicity work has been done towards the prevention of typhoid fever since the board was reorganized:

(1) Three bulletins on typhoid fever, with a total circulation of 110,000, have been printed and distributed to the people of Virginia.

(2) 60,000 copies of "Bedside Directions for Typhoid Fever Cases" have been printed and distributed.

(3) During every summer since the board was reorganized notices have been inserted in practically all the newspapers of the State explaining the prevention of typhoid fever.

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(4) 150,000 of our bulletins on the sanitary privy and 50,000 of the farmers' bulletin on the same subject have been sent out.

(5) Models of the sanitary privy have been exhibited in the farmers' institutes and trains.

(6) Not less than 200 lectures have been delivered in every part of Virginia, in which the prevention of typhoid fever was fully discussed.

When it is remembered that with all our scientific investigation of typhoid fever we have relied primarily upon popular education for the care of individual cases and for the proper disposal of infected sewage, the credit for the decrease in typhoid seems properly due to the better information of the people. This result, in our judgment, *justifies our theory that the common sense of the people is the chief reliance of successful health work.*

A further tribute to the part played by the public in better sanitation is to be found in our unique experience in enforcing the vital statistics law. Here was a place where, as we saw it, everything depended upon publicity. Our people were unaccustomed to the registration of births and deaths and did not know why the burial of their friends should not be allowed until a permit therefor had been procured. They were inclined, too, to believe that this was an undue and unreasonable interference on the part of the State in matters that concerned them alone. They were likewise unfamiliar with the method to be followed and knew nothing of the forms to be used. To attempt to enforce this law by invoking the penalties was, in our judgment, the best possible way to insure failure. *To appeal to the common-sense of our people was, we believe, the only rational and fair course.* Accordingly, we began a most extended and intensive campaign of publicity, the details of which will be found in the report of our publicity bureau. We began to emphasize the advantages which the individual citizen derived from a proper record of births and deaths in his family and we showed the people, as best we might, how this law was intended primarily for their own protection. This work, begun some months before the law went into effect, has been continued with results the most flattering. Within three months from the time the law became effective we are receiving almost enough death certificates to entitle us to registration under the United States Census Bureau—a distinction awarded only where ninety per cent. of all deaths are recorded.

Furthermore, we have had an experience unique, we believe, in the history of American registration. In all other States the registration of births has always been more difficult than the recordation of deaths. In every instance birth returns have come in only after the most prolonged agitation and the most exacting efforts. By appealing to the good sense of the people and by urging their co-operation on the basis of value received, we have, from the first, received more birth than death certificates and, it is safe to say, have a record in this respect absolutely new and uncontested. And the credit for this, be it remembered, belongs not to the officers who enforced the law, but to the people who co-operated. Surely there could be no better warrant for public co-operation in health work!

In concluding this section of our report, it gives us great pleasure to acknowledge the many courtesies extended us by the press of the State. Annually, in reflecting upon the various forces that have made possible the results achieved in Virginia, we have noted the part played by the newspapers. The

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past year has been no exception. Giving freely of their space and influence, they have enabled us to present to people, whom otherwise we might not reach, the great truths of prevention. The newspapers have been, and are, the greatest security of the people and their surest popular champion. In agitating boldly for better health they but exemplify their character. Our relations with editors have been pleasant and, in no fulsome laudation, we give them much of the credit for the better health of our people.

SANITATION IN THE SCHOOLS.

Further study of the sanitation of our schools confirms our view that here is one of the gravest, most neglected and most critical health problems in the Commonwealth. Our present enrollment in the public schools is 409,397, of which number 346,574 are in the counties and 62,823 in the cities. The average daily attendance throughout the Commonwealth is 263,241 (counties, 212,915; cities, 50,326). Thus many thousands of our future citizens are crowded daily for long hours in cramped, uncomfortable quarters at the most critical, formative period of their lives. Some of our schools are models of their kind and cannot be included in a condemnation of the system. Yet the majority of our schools are overcrowded, badly ventilated, badly heated, badly lighted and without decent sanitary arrangements. To send our children to some of these schools is to invite disaster and to encourage disease. The State is responsible alike for the mental, moral and physical well-being of its children during school hours and may expect to pay a fearful price for neglect of any one of these essentials.

Precisely how to guard the health of our children during the school session is a problem too extensive briefly to be discussed or lightly to be dismissed. Certain things, however, must be done. In the first place we must have better school buildings, or at the least buildings better ventilated and more correctly heated. Without these the necessary precautions cannot be taken against disease, nor can the best intellectual work be done. This need is fully appreciated by the Department of Public Instruction and will doubtless be met in all future construction. In the case of our old one-room schools some improvement is possible, but safety cannot be attained until these are supplanted by new and better-built houses.

Even more pressing than this need is the absolute necessity of privies in every school. At present the percentage of schools in rural districts provided with any form of privy is distressingly and dangerously small. Our girls must either suffer in body or in modesty to meet the calls of nature. Our boys must pollute the soil. *To deny these children sanitary conveniences is greatly to increase the danger of communicable disease, to say nothing of the liability to immorality.*

The board at its last meeting, under authority of the law authorizing it to promulgate regulations for the protection of the public health, adopted a rule requiring all school buildings to be equipped with sanitary privies. The enforcement of this regulation is left in the hands of the local authorities, but it should receive their heartiest support. We fully appreciate the fact that many of the counties are straining their utmost to improve their schools and that the construction of sanitary privies is a costly undertaking where there are many schools; yet we feel that this demand is paramount. It is

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better to sacrifice a month of a child's schooling than to endanger that child's health for life. It is better to build sanitary privies by shortening the school term than to continue the session at the expense of safety.

Again, in protecting the health of our children, we must realize the importance of universal medical inspection. In the country districts it is not possible, of course, to have a physician examine every child with a suspicious eruption or a sore throat, but it should in time be possible to give the teeth and eyes of these children a careful inspection at least once a year.

As far as our force has permitted, we have co-operated with the school authorities in improving sanitary conditions. A member of our staff spoke at the most of the summer normal schools; much of our literature has been sent the teachers in our schools; numerous inspections and investigations have been by us. In all of this work we have had the heartiest co-operation of the Hon. Jos. D. Eggleston, Superintendent of Public Instruction, and the support of nearly all the school authorities, whose interest in public health matters is the surest guarantee that the sanitary condition of our schools will be improved during the next few years.

DIPHTHERIA AND ANTITOXIN.

Against no disease has public health work been more successfully conducted than against diphtheria. This disease, once the terror of childhood, has lost its horrors. The cause is known, the method of diagnosis is simple, and a sure remedy exists in diphtheria antitoxin.

During the past year we have endeavored to press the war on diphtheria and to reduce its ravages in our midst. The arrangements made with Messrs. H. M. Alexander & Company, by which we distribute antitoxin prepared by them, have been continued with satisfactory results. The following table will show the number of units of antitoxin distributed during the last three years, the figures for 1911 and 1912 being arranged to conform to the fiscal years, while the statistics for 1909 and 1910 are for the calendar year:

Year.	*Units of Antitoxin Distributed.*
1909	7,949,000
1910	18,318,000
1911	20,994,000
1912	13,325,000

It will thus be observed that during the past year we have not distributed as much antitoxin as during the preceding year. At first sight this would seem to indicate that the public is not availing itself of this remedy as in previous years, but an explanation of the circumstances will render what seems an unfavorable condition a subject of sincere congratulation. When the State first began the distribution of antitoxin at the low rates private dealers in the State were charging very high prices for the remedy. But as the people became familiar with the arrangements by which they could procure antitoxin cheaply, the demand for antitoxin at the drug stores decreased tremendously. As a result, the dealers have been led to reduce their charges for antitoxin and

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to furnish it at a much lower figure. Thus our people not only have the means of getting antitoxin from the State, but of procuring it at reasonable rates from druggists in many localities. In effect, then, antitoxin at a fair figure is much more generally available.

In this connection, however, it may not be improper to point out, that during the last four years, the State saved to afflicted families $48,000 in the purchase of antitoxin below what would have been demanded of them at the old scale of prices.

The present arrangements for the distribution of antitoxin enable us to place this remedy in the hands of all but a few remote practitioners of medicine within twenty-four hours from the time their order is received. While this means the saving of much time, it is not altogether what we desire, for, to perform the maximum service, we must insure every physician cheap antitoxin without delay. We hope to perfect arrangements before another diphtheria season whereby we shall have antitoxin depots in various parts of the State, from which depots any physician may procure antitoxin within twelve hours.

The efficacy of present methods of handling diphtheria must be judged by the results. It is recognized, of course, that diphtheria is subject to variations, about which health officers know little. There are "good" years and there are "bad" years, apparently with little regard for precautions taken. Yet there should be some concrete connection between the antitoxin used and the mortality from the disease. Our statistics of reported cases for 1908 and 1912 show this as follows:

Year.	*Cases.*	*Deaths.*	*Mortality.*
Dec., 1908-Nov., 1909.....	2,946	209	7.09%
Oct., 1911-Sept., 1912.....	3,440	121	3.51%

In other words, where there has been an increase of 494 cases in rural Virginia during four years, there has been a decrease of eighty-eight deaths. To state the case in another form, where seven children of every one hundred victims of diphtheria died in 1908-1909, only 3.51 died in 1911-912.

While this is a source of deep gratitude to Providence, the actual increase in the number of cases may seem surprising. The explanation for this condition, however, is obvious. Waiving the question whether 1912 was a "bad" year while 1908 was a "good" year, certain facts will explain the situation. In the first place, many of our practitioners give immunizing doses of diphtheria to all exposed persons and take no further precautions. Such doses will, for a short while, prevent clinical symptoms of diphtheria, but they will not, in every instance, preclude the appearance of the diphtheria bacillus in the throat of an exposed person. As a result, an immunized person may be the means of spreading the disease. Again, the failure to observe the State regulations requiring release cultures in every case of diphtheria is undoubtedly responsible for the spread of the disease. A victim of diphtheria, it must be remembered, may often have recovered from all clinical evidences of the disease and may be, to all intents and purposes, entirely well, yet that person may harbor in his throat the most virulent form of diphtheria germs. The only safe course in the circumstances is to require quarantine until an ex-

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amination of a swab from the patient's throat shows that no germs are present. This is the justification of the regulation requiring such cultures and disregard thereof is responsible for the spread of the disease from the sick to the well. Finally, unrecognized cases of diphtheria are a fruitful source of infection. The symptoms of this disease vary much with the person and indeed may be practically negligible in a person whose throat will disclose the germs of the disease. Such cases, it is needless to point out, are carriers and should in every instance be quarantined.

To state these reasons for the spread of diphtheria in the form of precautions to prevent the spread, we believe that the following steps should be taken: First, where it is deemed wise to give an immunizing dose of antitoxin, the patient should be kept under observation and swabs should be taken to demonstrate that the germs are not present in the throat. Second, no patient should be allowed to leave quarantine unless a negative release culture be had. Third, the mild cases of the disease should be subject to precisely the same quarantine requirements as all other cases. If these things be done then we can hope that the reduction in the mortality from the disease shall be accompanied by an equally gratifying decrease in the cases of the disease.

INFANT MORTALITY.

The diarrhoeal diseases of childhood are still claiming a merciless toll of human life and are costing us hundreds of children who might be saved. We have done much educational work along the line of prevention and are encouraged to observe that a healthy public sentiment has been aroused, well indicated by the demand for our bulletin on the "Care of Infants."

In particular, we wish to call attention to the interesting work being done by Dr. E. C. Levy, chief health officer of Richmond, who has conducted a campaign along preventive lines for three years. His results have been encouraging in view of the fact that he has worked on badly-nourished infants from insanitary homes. The statement of his work contained in his annual report for 1911 will well repay a careful study.

ANTERIOR POLIO MYELITIS (INFANTILE PARALYSIS).

The appearance of epidemic infantile paralysis in many parts of the country during the last few years is a source of deep concern. Claiming a large mortality among stricken children, this disease is all the more distressing in that it often leaves its youthful victim hopelessly paralyzed. Until the present year, investigations of the disease had not met with success, but just as this report is presented, details have been received of very valuable results achieved by Professor M. J. Rosenau, of Harvard University. Dr. Rosenau showed that the stable fly (stomoxys calcitrans) carried the disease between monkeys and that the unidentified organism of the disease probably underwent a biological change in the body of the fly. At the same time that this discovery was announced Scandanavian scientists reported that they had produced the disease in animals by injecting into them secretions from persons suffering with polio. These results must, of course, be confirmed by other experiments, but they seem to indicate the proper line of

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attack. We anticipate that before many months it will be possible to frame quarantine rules for dealing with this disease.

Scattered cases of polio have been reported from various parts of the State, but there were no reports of epidemics. Three cases appearing in one county were investigated by us, but these seemed to have no connection.

PELLAGRA.

The pellagra situation in this State seems to be unchanged during the last year, and scientific opinion seems somewhat divided as to the probable future spread of this distressing malady. Careful study of the disease by many experts during the last year has been without result and the cause of the disease is as yet undiscovered, although it would appear to be reasonably established that the disease is particularly prevalent among persons of neurotic temperament. With our limited force we have been unable to make an investigation of pellagra, but we have compiled such information as we could regarding the cases in Virginia. Soon after the disease made its appearance in Virginia we printed a form for the tabulation of information regarding specific cases and requested immediate report of all cases. Whenever a physician reports pellagra we furnish him with a copy of the form and request him to fill this out and return it to us. A large number of cases have thus been reported in detail and the case-histories have been studied very thoroughly by Dr. Beverly R. Tucker, of Richmond, whose services the board deeply appreciates.

Speaking broadly, pellagra is a disease whose future course must carefully be watched. Should the disease assume alarming proportions and the cause be not discovered, it may become necessary to establish strict quarantine regulations. At present our knowledge is only sufficient to make us suspicious.

TYPHUS FEVER.

A notable discovery during the last year was made by Drs. Anderson and Goldberger, of the United States Public Health Service, who had been investigating typhus fever, sometimes called "spotted fever" or "jail fever." After a series of very interesting experiments these scientists proved that this disease was transmitted by the body louse (pediculus corporis), and that the clothing or fomites played no part in the spread of the fever. Thus it was established that our war on typhus fever must be a war on the body louse and that by eliminating the latter from suspected quarters, we can prevent the former.

At one time during the past year it seems as if this knowledge would be applied to conditions in Virginia. A suspicious case of fever appeared in Prince George county and the patient was carried to Petersburg. Physicians there suspected the case to be typhus and called on us for a diagnosis. Our epidemiologist agreed with the diagnosis, but wished to have his judgment confirmed by others. Accordingly, at our request, Surgeon General Rupert Blue, of the United States Public Health Service, detailed Dr. Goldberger, one of the investigators who discovered the cause of the disease, to make a study of the case. After a careful inspection and a number of laboratory tests, Dr. Goldberger was positive that the disease was typhus. On the

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heels of this discovery came a report of two other suspected cases in the same locality, which were visited by Drs. A. W. Freeman and Goldberger. These were found not to be typhus, nor have any other cases of the disease appeared.

The discovery of this case is an interesting incident of health work and nothing more. Typhus will hardly assume serious proportions in this part of the country and even should it appear the method of eradicating the disease will be comparatively simple. We shall only have to clean the patient and the infected quarters of vermin and may then be sure that the patient will not communicate the disease to others.

BUBONIC PLAGUE.

The appearance of bubonic plague in the West Indies during the past year is a source of genuine concern to the American States and particularly to those on the Atlantic seaboard. This dread disease is due to the bacillus pestis, which has been shown to infest rodents, particularly rats. This fact renders its control very difficult, especially where there is much shipping. The rat is a great traveler and has a fondness for docks and vessels. Only the excellent work of the United States Health Service has prevented the importation of plague into this country; only the strict enforcement of elaborate precautions give us assurance of future immunity. While we have no desire to appear as alarmists, it must be admitted that should plague assume serious proportions in the Antilles, Virginia must be prepared to take stringent action. Our extended seaboard, our numerous ports of entry and our large trade with the West Indies render us, with a few other States, the foci of danger. Already the health department of Norfolk is busily at work killing rats in anticipation of possible infection among them. Other cities will be forced to follow this example should new cases be reported from Porto Rico.

No suspected cases of plague and no infected rodents have been reported in Virginia during the past year.

ASIATIC CHOLERA.

During the last few years Asiatic cholera has advanced from the Orient into Europe and, in addition to its recurrence in Russia, has been found in Italy and in a few of the German ports. This dismal scourge is due to an organism popularly known as the "comma" bacillus, and ranks among the greatest enemies of human life. The federal government has been taking elaborate precautions during the last few years to prevent the importation of cholera cases and cholera carriers, and the officers of the government at the chief ports of entry have made a systematic examination of all immigrants. This foresight has been justified by the finding of several cholera carriers at Ellis Island, New York, although none of these has landed. To assist the States in the prevention of cholera, the United States Public Health Service has forwarded to us regular reports of all immigrants from cholera infected countries who propose to settle in Virginia. These cases have been followed up with the local health authorities, but no suspicious sickness has been found among them.

During the past year two suspected cases of cholera were reported in

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Virginia—one at a small seaport town, the other at a railroad centre in the western part of the State. Both cases were at once examined by the officers of the board and by the United States Public Health Service. The first case was soon disposed of as in nowise suspicious, but the second case caused us some temporary anxiety. Bacteriological examination, however, made it apparent that this case was not cholera.

ENLARGED QUARTERS.

In concluding this report, reference should be made to a few matters directly affecting the work of the board. The first of these was the enlargement of our office and laboratory quarters. We have been housed since 1908 in the residence No. 1110 Capitol street, which we shared with a private family. A year ago the city of Richmond purchased the block on which our building was located with a view of erecting a municipal courts building. Since that time, however, an act of Assembly was passed authorizing the Governor to purchase half of this block for a State office building. Furthermore, the quarters formerly occupied by us were so cramped as to seriously hamper our work. Our laboratory, where thousands of specimens were handled every year, was located in an old kitchen room, damp, insanitary and dark; three officers of the board and one stenographer were crowded into a single rear room. After the property changed hands we leased the whole house and made such changes as were necessary to equip a satisfactory laboratory on the second floor. This change involved some expense, which we felt justified in making in view of the fact that the State proposed to buy the property; but this expense was more than offset by the better facilities given us for work. The staff is unanimous in praising the new arrangement as increasing individual efficiency.

THE DEATH OF DR. RAWLEY W. MARTIN.

During the year the public health cause in Virginia suffered an irreparable loss in the death of Dr. Rawley White Martin, president of the State Board of Health. Dr. Martin was a notable figure in Virginia and his distinguished services were universally known, yet his true greatness was known only to those who were fortunate to be intimate with him. To these the nobility of his character, the purity of his motives and the altruistic purpose of his life seemed to lift him above the mass of men and to place him among the unsullied few. When the news of his passing was received we felt that the Commonwealth had lost one to whom there could be no successor.

At a called meeting of the board, held April 30, 1911, the following resolutions were adopted unanimously:

IN MEMORIAM.

Rawley White Martin, M. D.

1835-1912.

The State Board of Health of the Commonwealth of Virginia wishes to record its grief at the death of its venerable and revered president, Rawley White Martin, M. D., who departed this life at

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the noontide of usefulness and in the maturity of power, April 20, 1912.

Easily first among Virginia physicians, Dr. Martin entered the eternal school of the Great Physician after a unique career of service, patriotism and devotion. He was well tutored in the principles of his profession in the best schools of his generation; but he abandoned practice to answer to the call of his Mother State, and, with a zeal born of the deepest loyalty, rose to a high position in the service of the Confederate States. His was the honor to face the first battle-line of the foe on Virginia soil; his was the distinction to lead the vanguard at Malvern Hill; his was the glory to fall on the crest of the highest mounting wave of Confederate valor at Gettysburg; and his was the privilege, when the flag had fallen, to surrender his separate command two months after the Army of Northern Virginia had laid down its arms.

But famous as he was in the desperate battles of bloody war, he was even more distinguished in the stubborn contests of disease-fraught peace. To him, the humble disciple of the Master, his profession was sacred. His call was to minister to the wants of suffering mankind and his joy it was to go about doing good. No petty professional jealousy marred the splendor for his service and no blot was there on his 'scutcheon. Brother physicians throughout the State looked up to him as to a model of their profession and heaped upon him, as a token of their respect, the honors which he, in modesty, would have declined.

His, too, was the broader view of preventive medicine, and of this he was seer and prophet in this Commonwealth. With deep faith in the efficacy of his calling, he saw how it could be applied alike to the alleviation of human suffering and to the prevention of disease. Unmindful of profit and thoughtless of gain, he gave himself, his talents and his faith, to the work of public health. As president of this board, during the vital years of its history, his foresight, his unblemished honor and his love of humanity made him a potent power for good. Virginia has none to take his place.

His colleagues on the board cannot forbear a word of respect for the man. Humble, patient, courteous to all, considerate of others and thoughtful to a fault, he exemplified the virtues of Christian friendship and inspired all who were honored to know him. Prince among physicians, he was prince among men.

The board, by this resolution, directs that a copy of this memorial be spread upon a separate page of the record, that a copy thereof be published in the Virginia Health Bulletin and that a fair, engrossed copy be sent the family of Dr. Martin, to whom the board extends its sympathy in their bereavement.

By order of the Board of Health of the Commonwealth of Virginia, in special session convened, April 30, 1912, in the city of Richmond.

LEWIS E. HARVIE,
Acting Chairman.

W. M. SMITH,
Secretary.

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In searching for a new president, the mind of every member of the board turned to Dr. William M. Smith, of Alexandria, who was unanimously elected. Dr. Smith had been a pioneer in health work in Virginia and had endeared himself to all who know him. Dr. John B. Fisher, of Midlothian, long a valued member of the board, was elected secretary in place of Dr. Smith. The vacancy in the board caused by Dr. Martin's death was filled by the appointment of Dr. George B. Lawson, of Roanoke.

During the past year a second vacancy occurred in the board through the removal from the ninth district of Dr. John H. Dunkley, of Saltville. Dr. Dunkley changed his residence to Roanoke, in the fifth district, to the regret of those who had served with him. A physician of wide experience, a transparent gentleman and a constant attendant upon meetings of the board, Dr. Dunkley, in retiring, left warm friends and admirers on the board. The vacancy thus created was filled by the appointment of Dr. A. G. Crockett, of Max Meadows, a physician well known, able and beloved.

CHANGES IN PERSONNEL.

Aside from the changes in the staff of the Catawba Sanatorium, heretofore mentioned, the staff, with one exception, has not been changed during the past year. The enactment of the vital statistics law and the stipulation therein that the Commissioner should act as registrar made necessary the appointment of an assistant. As has already been indicated, Dr. W. A. Plecker was transferred from the field hookworm work to this position. In his place, on our nomination, the Rockefeller Commission named Dr. K. E. Miller as district inspector.

ACKNOWLEDGMENTS.

In reviewing the year, the Commissioner wishes to acknowledge the valuable assistance received from many sources. His Excellency, Governor William Hodges Mann, has been the unswerving friend of the board and has advised with us and aided us in every way possible. The United States Public Health Service has likewise been unremitting in its kindness. Surgeon General Blue, who became head of the service on the death of former Surgeon General Wyman, and Dr. John F. Anderson, director of the hygienic laboratory, have performed for us services of the greatest value. They have furnished us anti-rabic virus, assisted us in doubtful diagnoses and gave us the services of Surgeon L. L. Lumsden to co-operate in our investigation of endemic typhoid. Surgeon Lumsden has worked with us in previous years and his genial personality, his wide scientific experience and his acquaintance with our people made him invaluable.

It is scarcely necessary to state that the members of the State Board of Health have given freely of their time and experience in the solution of our problems. Representing as they do the highest standards of the medical profession and familiar with the details of health work, the members of the board have labored zealously and earnestly for the welfare of the Commonwealth.

We wish, likewise, to return our thanks to the congressmen from Virginia who supplied us with a very large stock of the valuable bulletin on the sanitary privy, to which reference is made in another part of this

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report. We have found our congressmen anxious as ever to co-operate in any constructive work for the State.

Again, we wish to express our thanks to the State Department of Agriculture. Through their kindness, a representative of the Board of Health was permitted to travel with the farmers' institute trains and to address thousands of our citizens on better health.

From all the officers and employees of the board, both in Richmond and at Catawba, the commissioner has received that continued allegiance and that enthusiastic co-operation which have made work a pleasure and success a surety.

CONCLUSION: THE HEALTH OUTLOOK.

In concluding this fourth annual report, there is much of gratification in retrospect and much of hope in prospect. Our State has made notable progress; typhoid fever, hookworm disease and tuberculosis have been notably reduced; our citizens have at command expert advice upon health questions; our physicians have laboratory facilities for diagnosis; we are actively engaged in war on the white plague and have an effective organization where four years ago we had nothing; the sanitation of our rural districts is improved; our small towns are beginning a forward movement; our cities are enjoying better health than ever before. Above all else, our people are aroused to the possibilities of preventive medicine and in their own homes are applying those principles which make for better health. Surely this is a cause for deep gratification and of thanks to those wise legislators who have fostered and furthered this work.

But what has been done gives but a glimmer of what may be achieved. Indeed, before us are untold possibilities of prevention. Typhoid fever, that summer scourge, may be eradicated; diphtheria may be made utterly to disappear; tuberculosis can be greatly reduced; the general health of our people can be vastly improved; our lives may be lengthened and brightened; our activity may be aroused anew. Nought that the State can do will be more productive of present good and of future happiness.

ENNION G. WILLIAMS,
Health Commissioner.

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Appendices

APPENDIX ONE.

Report of the Bureau of Rural Sanitation.

A. W. FREEMAN, M. D.,
Assistant Commissioner in Charge.

HOOKWORM DISEASE.

GENERAL STATEMENT.

The campaign against hookworm disease has been vigorously prosecuted throughout the year. The experience gained during previous years has resulted in a marked increase in the directness and efficiency of the work. The funds so generously supplied by the Rockefeller Sanitary Commission have made possible the employment of three district inspectors and of laboratory assistants sufficient to meet all reasonable needs of the work.

As will be seen in the succeeding pages of this report, the number of persons examined for the disease and of cases treated by the staff of the bureau show a tremendous increase over the figures for the previous years, while the all-important campaign of education has been vigorously continued and extended.

CHANGES IN STAFF.

During the report year several changes in the staff have been necessary. Dr. Herman G. Tarter resigned on January 19, 1912, and on July 1 Dr. W. A. Plecker, for two years district inspector in this bureau, resigned to take up the work of assistant registrar of vital statistics. On November 1, 1911, Miss Ollie B. Sydnor, who had been stenographer to the bureau, resigned and was succeeded by Miss Inez V. Goddin. Beginning May 15, additional laboratory equipments became necessary by reason of the marked increase in dispensary work, and Messrs. Frank W. Poindexter, Clarence B. Brown, M. M. Fisher and E. G. Cata were employed from time to time as the work demanded. Drs. Fisher and Brumfield, who have been with the work from the beginning, have continued throughout the year. Dr. K. E. Miller was added to the staff of field inspectors on June 24, 1912, and has been steadily at work since that time.

The work of the officers and employees of the bureau has been marked by an interest and enthusiasm which has contributed much to its success.

GENERAL PLAN OF WORK.

From the experience of previous years has been evolved a plan of campaign which in its first year of trial has demonstrated its effectiveness. This plan comprises two distinct lines of effort. During the summer months,

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when lines of communication are open, the entire force of the bureau has been concentrated on the operation of dispensaries for the education of the people and the diagnosis and actual treatment of the cases of the disease. During the winter months, when dispensary work is impracticable, on account of inclement weather, attention has been concentrated on work in the schools, and during the past winter a large number of schools were visited and inspected in this way.

Work of all kinds in rural districts was much handicapped by the almost unprecedently severe weather conditions of the winter of 1911-1912. During the whole of January and February travel in rural districts was exceedingly difficult and at times impossible. Schools were closed for weeks at a time, and those which continued open had only a small fraction of their normal attendance. In spite of these conditions, however, work was prosecuted as vigorously as possible.

DISPENSARY WORK.

Notwithstanding the somewhat discouraging results of dispensary work during the summer of 1911, it was determined to give the method an additional and more thorough trial during the summer of 1912. With this end in view, the field force began on May 1 with preparations for dispensary work on a large scale. The plan of work was similar to that pursued in 1911, using the experience of that year as a basis.

The first step in any county was a visit by a district inspector to enlist the support of the local board of health, the medical profession and the public school authorities. When this had been done an appeal was made to the county board of supervisors for financial aid in carrying on the work. While in some cases in the early months of the summer dispensaries were conducted in the absence of an appropriation from the county, later on the hard and fast rule was adopted that no dispensary would be opened until the appropriation had been made. This was done for two reasons: In the first place, where sufficient interest had not been aroused to secure the appropriation, the dispensary is not successful, and in the second place the necessary expense of a large dispensary is greater than the resources of the bureau could meet unaided. Dispensaries were conducted in Essex and King and Queen counties in the absence of an appropriation and were not markedly successful. In Bedford, Franklin, Henry and Patrick counties appropriations of $100.00 per county were made by the supervisors, and in all these counties the dispensary was an overwhelmning success.

When an appropriation had been secured advertising was begun. This consisted of large posters, hand-bills, reading notices and advertisements in the county papers, small cards which were dropped into letter boxes by rural mail carriers, and a few public lectures. Six conveniently located points in each county were chosen and at each of these a dispensary was held one day each week for the four weeks. This dispensary was equipped with all necessary appliances and material for the microscopic diagnosis and medical treatment of the cases. It was manned by the district inspector with sufficient assistance to secure the prompt examination of all specimens submitted and the treatment of all persons found infected. No case was treated until a microscopic examination had shown it to be a true case of hookworm disease.

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Bedford County.

To Bedford county belongs the distinction of being the first county in the State to appreciate the possibilities of the hookworm dispensary to the people at large, and to avail itself of its benefits. After an appropriation of $100.00 had been made by the supervisors, and the usual advertising had been done, the dispensary was opened on May 20 at Huddleston, on the Virginian railway. While the attendance the first week was not large, it was encouraging and increased steadily each week until at the end of the four weeks 1,363 people had been examined, of whom 361 showed the presence of hookworm disease and were treated.

Franklin County.

Franklin county following the lead of Bedford county appropriated, on July 1, $100.00 to aid in the work and on July 15 the dispensary was opened. The attendance was large from the start and increased steadily until at the end of four weeks the demand for further work was so great that an additional week was granted the county. In the five weeks 4,659 persons were examined microscopically for hookworm disease, of whom 1,195 showed the presence of infection and were given treatment. This dispensary marked high-water for attendance in the State and will probably remain a record for sometime to come.

Henry County.

Following the lead of Franklin and Bedford, the supervisors of Henry county appropriated $100.00 for the work and on August 15 dispensary work was begun. In the four weeks 2,563 were examined, of whom 912 showed the presence of the disease and were treated.

Patrick County.

On September 15 work was begun in Patrick county following an appropriation of $100.00 by the supervisors and in four weeks 3,776 people were examined, of whom 1,666 were found infected and treated.

King and Queen County.

At the May meeting of the supervisors of King and Queen county Dr. A. C. Fisher appeared before the board of supervisors and made application for an appropriation of $100.00. As no dispensary work had been done in this neighborhood, the supervisors were unwilling to appropriate this amount, but appeared willing to do so should the dispensary prove a success. In marked contrast to the results in the Piedmont counties detailed above, the attendance in King and Queen county was very disappointing. Only 276 persons appeared for examination, of whom 147 were positive for hookworm disease and were treated. The results of this dispensary were so disappointing that no further application was made to the supervisors for aid.

Essex County.

Owing to a conflict in dates of meeting, application could not be made to this board until just prior to the opening of the dispensary, at which

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time it was refused, the supervisors pleading lack of information on the subject. This dispensary, like that in King and Queen county, proved disappointing, in spite of strenuous efforts to make it a success. However, 699 people were examined in four weeks, of whom 307 were found infected and treated. At a subsequent meeting of the board of supervisors, application for an appropriation was made and refused.

Gloucester County.

At the September meeting of the board of supervisors, Dr. A. C. Fisher appeared in behalf of an appropriation for dispensary work, which was promptly granted in the following terms:

> At a meeting of the board of supervisors of Gloucester county, held at the court house thereof on the 28th day of August, 1912, it is ordered, by unanimous vote of the board of supervisors, that the sum of one hundred dollars be, and the same is hereby appropriated, out of the county levy of the current year, to aid in the work of eradicating the "hookworm" in the county of Gloucester; and it is earnestly requested that all school officers and other officials in this county, the ministers of the gospel, as well as the people generally, will give their hearty co-operation in this movement. And the clerk of this board is directed to have printed 200 copies of this order, and distribute same amongst the said officials, ministers and other citizens of Gloucester county.
>
> A copy—teste:
>
> (Signed) C. E. SHACKELFORD,
> *Deputy for* A. T. WIATT, *Clerk.*

Notwithstanding this favorable beginning and the fact that the dispensary was extensively advertised, the attendance was the smallest of any conducted by the bureau. Only 169 people were examined, of whom thirty-one proved positive and were treated. No request has been made of the county for the payment of any funds in connection with this dispensary.

Summary of Dispensary Work.

COUNTY	INSPECTOR IN CHARGE	Appropriation by county	Number examined	Per cent. possessed	Number treated	Total treatments given out
Bedford	W. A. Brumfield	$100 00	1,368	26.6	361	807
King and Queen	A. C. Fisher		276	53.2	147	310
Franklin	K. E. Miller	100 00	4,659	25.6	1,195	4,659
Henry	W. A. Brumfield	100 00	2,568	35.6	912	2,568
Essex	A. C. Fisher		669	45.8	307	369
Patrick	K. E. Miller	100 00	3,776	44.1	1,666	4,994
Gloucester	A. C. Fisher	100 00	169	18.3	24	26
		$500 00	13.475		4,619	13,728

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SCHOOL WORK.

During the months when dispensary work was impossible on account of weather conditions, attention was concentrated on schools. The purpose of this work was to secure an accurate index of the percentage of infection among the school children of the various counties; to secure the treatment of as many as possible of the infected children; to accurately determine the sanitary conditions of the schools and to educate teachers, children and parents as to the dangers of hookworm infection.

Method of Work.

The method of this work was exceedingly simple. The inspector, furnished with a supply of specimen boxes, envelopes and letters to parents, visited the school. On his first visit he lectured to the children on hookworm disease, showed them charts and specimens, and gave to each pupil an envelope containing a specimen box and a letter explaining the purpose and importance of the work and asking the parents of the child to aid in it by submitting specimens from the children of the family. The inspector then made arrangements to return and collect the specimens at subsequent dates or requested the teacher to send them in by express to the Richmond laboratory. When report of these examinations was received from the laboratory he revisited the school and dispensed treatments to all those children who needed it. This work was carried on in Campbell, Halifax, Pittsylvania, Mecklenburg, Lunenburg, Brunswick, Greeneville, Southampton, Essex, Middlesex, Mathews, Gloucester, King George and King William counties.

Schools Inspected by District Inspectors.

	Dr. Plecker	Dr. Fisher	Dr. Tarter	Dr. Brumfield
First quarter	52	33	----	87
Second quarter	44	79	5	114
Third quarter	22	13	43	----
Fourth quarter	----	----	----	----
Total, 492.	118	125	48	201

PERCENTAGE OF INFECTION OF SCHOOL CHILDREN.

The results of the microscopic examination of school children of a number of counties of the State, as disclosed by the table below, should give rise to thoughtful consideration on the part of the people of Virginia. That forty-three per cent. of the children of seventeen (17) counties should be found upon actual microscopic examination to be infected with a disease which in its more serious forms is fatal, and which even in its mildest form seriously affects the physical and mental condition of the patient, is a fact of profound significance.

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PERCENTAGE OF INFECTION OF SCHOOL CHILDREN.

Based on Microscopic Examination of at Least Two Hundred Children of School Age, from the Rural Districts of Each County.

COUNTY	Number examined	Number showing hookworm	Per cent. showing hookworm
Bedford	251	57	22.7
Brunswick	361	176	48.7
Campbell	425	84	19.7
Essex	280	155	55.4
Franklin	888	378	42.8
Greensville	326	212	66.5
Halifax	252	94	37.3
Henry	1,287	685	49.3
Lunenburg	478	172	35.9
Mecklenburg	947	334	35.2
Middlesex	252	65	25.7
Northumberland	219	31	14.1
Patrick	954	636	66.6
Pittsylvania	343	128	37.3
Richmond	516	182	35.2
Southampton	286	124	43.3
Westmoreland	223	124	55.6
	8,283	3,587	

Percentage of infection of children of school age from seventeen counties, 43.5.

SANITARY SURVEY.

In order to determine exactly what sanitary conditions are to be found in every county, a sanitary survey of the State has been undertaken. For this purpose an inspector of the bureau visits each county and inspects not less than 100 homes. These homes are taken from different localities throughout the country in order that an estimate of actual conditions may be made. The results of this inspection are tabulated in accordance with a scale devised by Dr. C. W. Stiles, of the United States Public Health Service. This scale is as follows:

Class	DESCRIPTION	Value
A	Sewered or marine hospital barrel	100
B	Sanitary privy, fly proof, having water-tight receptacle	75
C	Same as B, except not rigidly fly proof	50
D	Surface privy closed in back	25
E	Surface privy open in back	10
F	No privy	0

From the results of the inspection of a county a sanitary index for that county is computed according to this table by assigning to each home inspected the proper value for the class in which it falls and dividing the total arrived at in this manner by the number of homes inspected. The number thus obtained is the sanitary index.

In the following counties inspections have been made with the results indicated and the sanitary indices of the various counties are given:

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TABLE OF SANITARY SURVEYS.

ALBEMARLE COUNTY.

3	at 100%,	Class A		300
0	at 75%,	Class B		
0	at 50%,	Class C		
28	at 25%,	Class D		700
160	at 10%,	Class E		1,600
18	at 0%,	Class F		
209			209	2,600

Sanitary index for county, 12.4%.

BEDFORD COUNTY.

0	at 100%,	Class A		
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
19	at 10%,	Class E		190
132	at 0%,	Class F		
151			151	190

Sanitary index for county, 1.2%.

BRUNSWICK COUNTY.

White:

1	at 100%,	Class A		100
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
38	at 10%,	Class E		380
19	at 0%,	Class F		

Colored:

0	at 100%,	Class A		
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
12	at 10%,	Class E		120
33	at 0%,	Class F		
103			103	600

Sanitary index for county, 5.8%.

CAMPBELL COUNTY.

1	at 100%,	Class A		100
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
51	at 10%,	Class E		510
176	at 0%,	Class F		
228			228	610

Sanitary index for county, 2.7%.

HALIFAX COUNTY.

0	at 100%,	Class A		
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
43	at 10%,	Class E		430
107	at 0%,	Class F		
150			150	430

Sanitary index for county, 2.8%.

HANOVER COUNTY.

0	at 100%,	Class A		
6	at 75%,	Class B		450
0	at 50%,	Class C		
3	at 25%,	Class D		75
147	at 10%,	Class E		1,470
58	at 0%,	Class F		
214			214	1,995

Sanitary index for county, 9.3%.

KING GEORGE COUNTY.

0	at 100%,	Class A		
0	at 75%,	Class B		
0	at 50,%	Class C		
0	at 25%,	Class D		
103	at 10%,	Class E		1,030
101	at 0%,	Class F		
204			204	1,030

Sanitary index for county, 5.0%.

KING AND QUEEN COUNTY.

0	at 100%,	Class A		
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
164	at 10%,	Class E		1,640
75	at 0%,	Class F		
139			139	1,640

Sanitary index for county, 6.8%.

LANCASTER COUNTY.

0	at 100%,	Class A		
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
73	at 10%,	Class E		730
81	at 0%,	Class F		
154			154	730

Sanitary index for county, 4.7%.

LOUISA COUNTY.

1	at 100%,	Class A		100
0	at 75%,	Class B		
0	at 50%,	Class C		
8	at 25%,	Class D		200
155	at 10%,	Class E		1,550
40	at 0%,	Class F		
204			204	1,850

Sanitary index for county, 9.0%.

LUNENBURG COUNTY.

1	at 100%,	Class A		100
1	at 75%,	Class B		75
0	at 50%,	Class C		
0	at 25%,	Class D		
60	at 10%,	Class E		600
88	at 0%,	Class F		
150			150	775

Sanitary index for county, 5.1%.

MATHEWS COUNTY.

0	at 100%,	Class A		
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
78	at 10%,	Class E		780
60	at 0%,	Class F		
138			138	780

Sanitary index for county, 5.7%.

MECKLENBURG COUNTY

White:

1	at 100%,	Class A		100
0	at 75%,	Class B		
0	at 50%,	Class C		
0	at 25%,	Class D		
51	at 10%,	Class E		510
117	at 0%,	Class F		

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TABLE OF SANITARY SURVEYS—CONTINUED.

MECKLENBURG COUNTY—Continued.

Colored:			
0 at 100%,	Class A		
1 at 75%,	Class B		75
0 at 50%,	Class C		
0 at 25%,	Class D		
1 at 10%,	Class E		10
41 at 0%,	Class F		
212		212	695

Sanitary index for county, 3.3%.

MIDDLESEX COUNTY.

0 at 100%,	Class A		
0 at 75%,	Class B		
0 at 50%,	Class C		
0 at 25%,	Class D		
137 at 10%,	Class E		1,370
38 at 0%,	Class F		
175		175	1,370

Sanitary index for county, 7.8%.

NORTHUMBERLAND COUNTY.

0 at 100%,	Class A		
0 at 75%,	Class B		
0 at 50%,	Class C		
0 at 25%,	Class D		
79 at 10%,	Class E		790
67 at 0%,	Class F		
146		146	790

Sanitary index for county, 5.4%.

PITTSYLVANIA COUNTY.

0 at 100%,	Class A		
0 at 75%,	Class B		
0 at 50%,	Class C		
0 at 25%,	Class D		
32 at 10%,	Class E		320
192 at 0%,	Class F		
224		224	320

Sanitary index for county, 1.4%.

RICHMOND COUNTY.

0 at 100%,	Class A		
0 at 75%,	Class B		
0 at 50%,	Class C		
0 at 25%,	Class D		
104 at 10%,	Class E		1,040
166 at 0%,	Class F		
270		270	1,040

Sanitary index for county, 3.8%.

SOUTHAMPTON COUNTY.

0 at 100%,	Class A		
0 at 75%,	Class B		
0 at 50%,	Class C		
33 at 25%,	Class D		825
80 at 10%,	Class E		800
69 at 0%,	Class F		
182		182	1,625

Sanitary index for county, 8.9%.

SPOTSYLVANIA COUNTY.

1 at 100%,	Class A		100
0 at 75%,	Class B		
0 at 50%,	Class C		
14 at 25%,	Class D		350
130 at 10%,	Class E		1,300
67 at 0%,	Class F		
212		212	1,750

Sanitary index for county, 8.2%.

STAFFORD COUNTY.

0 at 100%,	Class A		
0 at 75%,	Class B		
0 at 50%,	Class C		
0 at 25%,	Class D		
98 at 10%,	Class E		980
102 at 0%,	Class F		
200		200	980

Sanitary index for county, 4.9%.

WESTMORELAND COUNTY.

0 at 100%,	Class A		
0 at 75%,	Class B		
0 at 50%,	Class C		
0 at 25%,	Class D		
54 at 10%,	Class E		540
61 at 0%,	Class F		
115		115	540

Sanitary index for county, 4.7%.

The result of this survey, as shown by this table, reveals a condition of sanitation in the rural homes of Virginia which is almost unbelievable. Until this condition is improved, the widespread dissemination of human filth, which inevitably accompanies such a condition, will result in the continued prevalence of typhoid fever and hookworm disease in Virginia in spite of any other preventive measures which may be taken.

MICROSCOPICAL EXAMINATION OF PATIENTS.

Experience gained early in the hookworm campaign indicated that treatment for hookworm disease and statements as to its prevalence must be based upon actual microscopic examination. Where this examination is so easy and

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so certain in its results it seems exceedingly unwise to trust to clinical evidence as a basis for treatment, and in any estimate of the degree of infection in any locality the microscope must be the final judge. Bearing these facts in mind, a considerable proportion of the energies of the bureau have been directed toward the actual microscopic examination of patients. The table below gives the results of this work.

Microscopic Examinations.

COUNTY	Number examined	Results hookworm	Results negative
Franklin	4,659	1,195	3,464
Bedford	1,363	361	1,002
Essex	669	307	362
Patrick	3,776	1,666	2,110
Henry	2,563	912	1,651
King and Queen	276	147	129
Gloucester	169	31	138
Total dispensary	13,475	4,619	8,856
Richmond laboratory	6,722	2,074	3,872
Grand total	20,197	6,693	12,728

TREATMENT OF PATIENTS.

As has been repeatedly stated in the reports of the bureau, the actual treatment of cases is, and always will be, a most important feature in any campaign against hookworm disease. The treatment of a case is not only of vast benefit to the patient himself, but is the most potent educational factor in securing the treatment of other cases, and, more important still, the improvement of sanitary conditions. The treatment of cases has been prosecuted vigorously during the past year. As will be seen from this report, the number of cases treated shows a large increase over the previous years. It is to be regretted that no statement as to the number of cases treated by the physicians during the year is available in time for this report. This statement is made up from post-card returns from physicians at the end of the calendar year. The following table shows the number of cases treated during the past year:

Cases Treated by Staff.

Method.	*Total No. Persons*
By dispensary, By school, and Personal work	4,619
First quarter	2,069
Second quarter	2,069
Third quarter	1,016
Fourth quarter	454
	8,832

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EDUCATIONAL WORK.

While there has been a very marked increase in the number of examinations made and the number of cases treated, there has been no diminution in the amount of educational work done. During the year a new edition of the hookworm bulletin was issued and 40,000 copies were circulated. A leaflet, giving in brief form the essential facts regarding hookworm disease, was prepared and 30,000 were distributed by the district inspectors. Through the courtesy of the Virginia representatives in Congress 40,000 copies of bulletin No. 463, of the United States Department of Agriculture, were furnished free of cost in penalty envelopes. These were distributed in the districts of the various members furnishing them. The State Department of Agriculture kindly permitted the use of their addressograph list of names and the total cost of issuing this large number of copies of this most valuable bulletin was merely nominal.

The regular press service of the department has carried frequent notices regarding the hookworm work. The lecture campaign has been vigorously pressed as will be seen from the following table:

Public Lectures Delivered by Staff of Bureau.

	Lectures	Number attendance
First quarter	200	17,576
Second quarter	242	22,540
Third quarter	42	2,493
Fourth quarter	105	15,967
	589	58,576

As in former years, the director of the bureau was, through the courtesy of the railroads and the State Department of Agriculture, enabled to accompany several of the farmers' institute trains and to reach thousands of country people in this particularly favorable manner.

SUMMARY.

In summing up it may be said that the hookworm work has progressed in both volume and effectiveness during the past year. Twenty thousand, one hundred and ninety-seven (20,197) people were microscopically examined for hookworm disease during the year; 8,378 people were treated one or more times for the disease; 589 public lectures were delivered to 58,576 people; approximately 110,000 pieces of literature were distributed; 492 schools were inspected and free microscopic examination offered to all the pupils; in counties an accurate sanitary survey has been made and in seventeen counties the percentage of infection of school children has been accurately determined.

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TYPHOID FEVER.

GENERAL STATEMENT.

The work against typhoid fever has been continued through the year along the lines laid down in previous reports. Three principal lines of endeavor have been followed as heretofore—investigation of local outbreaks, investigation of endemic rural typhoid fever, and the campaign of popular education in the causes and prevention of typhoid fever.

PREVALENCE OF THE DISEASE IN 1911-1912.

It is a pleasure to record the fact that the number of cases of typhoid fever, as estimated from the reports made to this department, show a decrease of twenty-nine per cent. from the number occurring in the preceding twelve months. The figures for the total estimated number of cases in each month of the four years for which statistics are available are given in the table below. This estimate is made by assuming that the number of physicians who did not report each month had the same number of cases of typhoid each as the average of those who did report for that month. We believe this estimate to be within ten or fifteen per cent. of the true number. On this basis the total number of cases occurring between October, 1911, and October, 1912, is 8,740, as against 11,803 for the same period of the previous year.

TYPHOID FEVER.

Estimated Number of Cases Reported Each Month, October, 1908, October, 1912.

	January	February	March	April	May	June	July	August	September	October	November	December
1908	------	------	------	------	------	------	------	------	------	2,133	1,086	766
1909	348	387	299	290	509	1,450	3,185	1,844	1,768	1,303	824	591
1910	435	332	377	401	427	796	1,968	2,325	2,064	1,352	839	486
1911	317	250	200	260	406	1,118	2,545	2,264	1,766	1,500	1,110	604
1912	451	245	206	240	360	515	854	1,325	1,070	------	------	------

Monthly Mean Temperatures, Richmond, Va., 1909-1912, from Reports United States Weather Bureau.

	January	February	March	April	May	June	July	August	September	October	November	December
1909	42	47	46	58	66	76	77	74	67	55	53	36
1910	39	39	54	58	64	70	78	75	72	61	42	34
1911	42	41	45	52	70	75	80	78	78	59	45	43
1912	29	35	45	60	67	72	78	76	73	------	------	------

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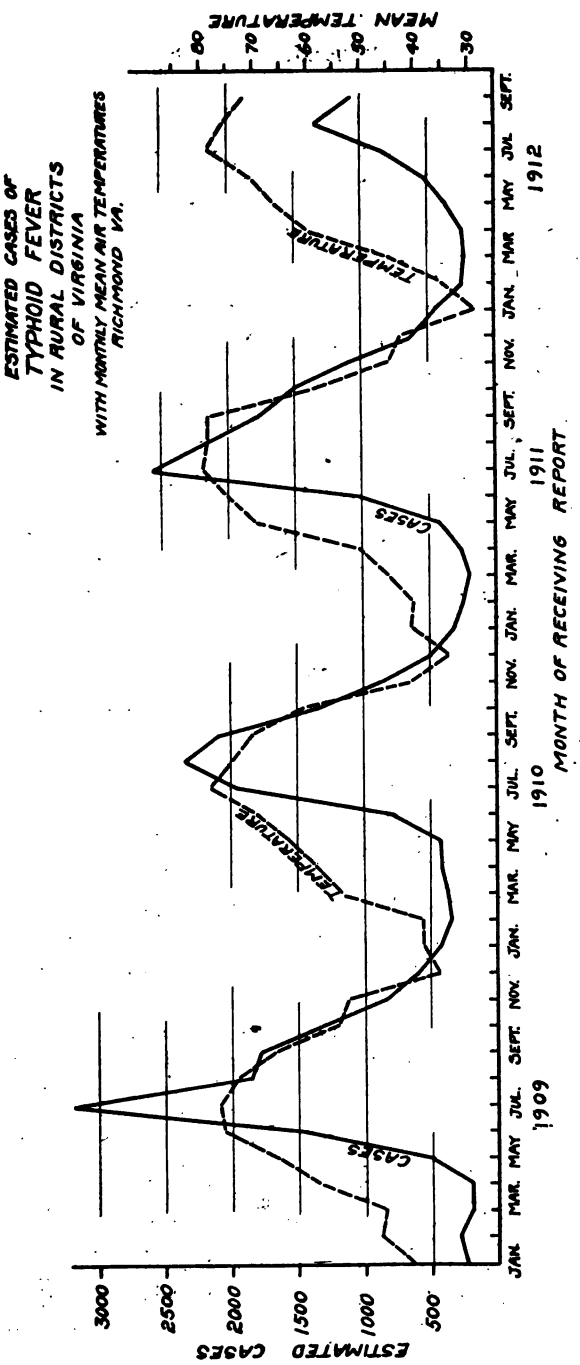

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The striking decrease in the number of cases, amounting, as has been said, to twenty-nine per cent., is a source of great gratification to every one interested in typhoid prevention in Virginia. As will be seen from the accompanying chart, which is an extension of the one published in previous years, the curve of typhoid fever resembled in its general features that of previous years. The marked difference between the curve for the summer of 1912 and that for previous summers being in the facts that in 1912 the abrupt rise commonly seen in May did not begin until July, and the maximum number of cases for any one month of the summer was 1,325, as against 2,545 in July, 1911, 2,325 in August, 1910, and 3,185 in July, 1909.

The reasons for the marked reduction observed in the number of cases of typhoid reported during the summer of 1912 are not obvious. Temperature conditions did not differ markedly from those normal for the season except during January and February. As will be seen from the table of mean temperature, January and February were markedly below the mean, March and May just normal, April somewhat above and June three degrees below the normal. Whether or not the cool and pleasant June weather influenced greatly the typhoid curve of the following months is a question which only further observations over a period of years can settle.

Average Monthly Mean Temperature for the Past Thirty-three Years from Reports United States Weather Bureau.

January	February	March	April	May	June	July	August	September	October	November	December
38.0	39.9	46.9	57.2	67.3	75.1	79.2	77.5	70.8	59.8	48.8	41.0

There can be no question that the campaign of education which has been carried on for the last four years has had a profound effect on the prophylaxis carried on in connection with known cases of typhoid. The differences in this respect are very noticeable to any one who has inspected cases of typhoid fever in the rural districts of Virginia during the four years. It may be assumed that these precautions have had their effect, and that the exceptionally favorable showing of the summer of 1912 as regards typhoid fever is to be attributed in part to a season favorable from the standpoint of temperature, and in part to the results of the better education of the people of the rural districts of Virginia.

INVESTIGATION OF OUTBREAKS.

No serious outbreaks of typhoid were reported during the report year. Numerous small outbreaks, many of which would have passed unnoticed in past years, were reported and investigated, but there was a marked decrease in the number reported as compared with previous years. This decrease was so marked that during the month of July the field force, which had been enlarged to meet the usual demand for investigations, was enabled to answer every request for investigation immediately upon its receipt, and

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at times had opportunity for independent investigations in communities from which no report had been received.

We were fortunate in securing for the work of investigation the services of Dr. J. Alex. Waddell, of the University of Virginia. Dr. Waddell has had several years' experience in the work of the department, and is unusually well fitted for it. His work during the year was markedly successful.

DETAILED INVESTIGATIONS.

Chatham, Virginia.—On October 14, 1911, request was received from the authorities of the Chatham Episcopal Institute for an investigation of the typhoid situation in that school. Five cases had developed in the school within a few days. Investigation showed the fact that the cases had all been in contact, more or less direct with a case in the incubative stage of typhoid who had developed the disease shortly after leaving the institution. No further cases developed and the school continued work without serious interruption.

Blacksburg, Virginia.—On November 14 request was received from President P. B. Barringer for an investigation of conditions in the Virginia Polytechnic Institute. Three cases had developed in students of the institute within a few days. These cases were found on investigation to be due to infection contracted while away from the institution on a trip with the football team. No further cases developed, and the work of the school was not interrupted.

Emporia, Virginia.—Dr. J. A. Waddell on July 12 investigated conditions in Greensville county. Only a few scattered cases were found, not in anyway connected with each other, and due to general insanitary conditions.

Franklin, Virginia.—Investigation of conditions around Franklin disclosed a number of cases in the town and surrounding country. The cases were apparently not connected, and seemed due to insanitary conditions, which were pointed out to the local authorities.

Accomac and Northampton.—Investigation was made of conditions in the two counties of the Eastern Shore. The number of cases was found to be much less than in previous years and scattered over a wide territory. No conditions approaching epidemic were found. Visits were made to Cape Charles, Chincoteague, Tangier, Parksley, Keller, Sanford, Onancock and Nassawaddox.

Hampton, Virginia.—Unofficial information of an epidemic at Hampton, Virginia, having reached this office, Dr. Waddell visited Hampton in an effort to learn the facts. The health officer, Dr. Hope, placed all the information in his possession at the disposal of Dr. Waddell. The epidemic, which involved twenty-eight cases, had been over two months by the time of Dr. Waddell's visit and further investigation was useless. The epidemic apparently developed after an entertainment at one of the public schools and was ascribed by the local authorities to the infection of some chicken salad which was served at that time. No official report was made to this department during the course of the epidemic.

Richmond and Northumberland Counties.—As in previous years, a number of cases were reported from the counties of Northern Neck. These were investigated by Dr. Waddell, who visited Lively, Burgess Store and Hacks Neck. The cases were scattered over the rural districts and were apparently

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due, for the most part, to contact with previous cases and spread from insanitary privies. These cases are illustrative of a large number of cases which are reported each year from rural districts, particularly among the negroes. In such cases the prevailing sanitary conditions favor the spread of the disease, and in the absence of improvement of these conditions no relief can be afforded the infected neighborhood.

Big Stone Gap, Virginia.—Request being received from Big Stone Gap for an investigation, a visit was made to that community. Seven cases were found, confined to one locality of the town. All were in houses furnished with open privies and the spread of the disease seemed due to infection from that source. Recommendations for control of the situation were made to the local authorities and no further cases were reported.

Gate City, Virginia.—Investigation of conditions at Gate City showed six scattered cases, apparently due to prevailing insanitary conditions. Recommendations for improvement were made to the local authorities, and diligent search failed to reveal the origin of the first case.

ANTERIOR POLIOMYELITIS.

Several cases of anterior poliomyelitis being reported from Charlotte county, investigation was made by Dr. Waddell. The diagnosis was confirmed and several additional cases were discovered. The data collected was recorded for further study.

LABORATORY INVESTIGATION OF TYPHOID FEVER.

Continuing the interesting work begun in 1911, this bureau spent several weeks during the summer of 1912 in a laboratory study of typhoid fever. In order to secure the best results, the board requested the Surgeon General of the United States Public Health Service to detail Surgeon L. L. Lumsden to work with us. Dr. Lumsden, a native of Virginia, had been engaged in the study of typhoid during the previous summer and was, by temperament and training, admirably suited for co-operation. The Surgeon General consenting, Dr. Lumsden was placed in charge of the laboratory end of the investigation, with Dr. W. E. Bray as assistant, while Drs. A. W. Freeman and J. A. Waddell carried on the field work. After careful consideration we decided to open the laboratory for the field investigation in Roanoke in order to reach as many cases of rural typhoid as possible. Through the kindness of Chief Health Officer W. Brownley Foster, M. D., the laboratory was opened in the offices of the Roanoke city health department and continued its work until September 8.

The object of the investigation carried on was to determine, as far as practicable, the prevalence of the typhoid bacillus in an infected community. If there were typhoid in a given household, precisely where might the typhoid bacillus be expected and where he might reasonably be supposed to be absent? In the same way, if typhoid was prevalent in a community, where must we look for those agencies which carry the germs from the sick to the well? The usual means of carriage are, of course, well understood, but there are many other means not at present understood.

To collect data on this subject our field investigators visited as soon as possible every infected household in the territory around Roanoke and

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investigated each case in detail. Specimens of every possible character were collected and were subjected to a close bacteriological examination in Roanoke. The results of this investigation are not yet in shape for the press, but they are, in our judgment, interesting and throw considerable light on the possible spread of typhoid. We plan to continue these investigations during the coming year and hope from them ultimately to discover new methods of typhoid control, if new methods there be.

The detailed report of our investigation will be issued during the coming winter as a special number of the Virginia Health Bulletin.

TYPHOID EDUCATIONAL WORK.

There remains for us simply to refer to the educational work done during the last summer as a part of the typhoid campaign. In connection with the bureau of publicity, we issued special bulletins, sent out bedside directions and carried on a newspaper agitation, the details of which will appear in the report of that bureau. The aggregate, we believe, was most helpful to the work and responsible, in no small degree, for the very creditable showing made in the reduction of typhoid.

APPENDIX TWO.

Report of the Laboratory.

MEADE FERGUSON, Ph. D.,
Director in Charge.

GENERAL STATEMENT.

In forwarding the usual statistical information regarding the work of the laboratory, the director wishes to record the gratifying increase in the use of this branch of our work by the physicians of the State. Every year since the reorganization of the board it has been pleasant to observe an increase in the work done and this increase has been marked during the fiscal year just ended.

The new facilities afforded the laboratory by the enlarged quarters are reflected in the ease and safety with which routine work and investigations can now be done. Nothing in the history of this bureau has been more important than this change; nothing has meant more to the proper discharge of duty.

Appended to the statistical tables will be found the report of the Hampton investigation made by the laboratory and the bureau of sanitary engineering.

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TABLE I.

BACTERIOLOGICAL REPORT.

Specimens Examined for Various Diseases, and Water Examined During the Fiscal Year October 1, 1911-September 30, 1912.

	Tuberculosis	Diphtheria	Typhoid	Hookworm	Miscellaneous	Total Bacteriological	Water	Total
1911								
October	110	247	168	435	12	972	37	1,009
November	103	789	106	888	251	2,839	32	2,171
December	109	145	44	477	196	971	16	987
1912								
January	138	71	54	702	8	973	11	984
February	141	39	50	1,436	6	1,672	12	1,684
Mareh	202	35	44	750	598	1,629	18	1,647
April	185	44	58	598	10	890	65	955
May	200	34	68	408	5	715	21	736
June	152	22	109	364	173	820	21	841
July	161	31	389	191	17	789	38	827
August	150	46	540	342	16	1,094	78	1,172
September	145	89	306	136	28	704	53	757
Total	1,796	1,592	1,988	6,722	1,320	13,368	402	13,770

TABLE II.

Statement Showing Counties and Cities from Which Specimens Have Been Received, with the Number of Each Class Thereof.

COUNTY	Tuberculosis			Diphtheria			Typhoid Fever			Hookworm			Miscellaneous	Total
	Pos.	Neg.	Atyp	Pos.	Neg.	Atyp	Pos.	Neg.	Atyp	Pos.	Neg.	Other parasites		
Accomac	2	11	------	3	2	1	2	32	5	------	------	------	------	58
Albemarle	5	28	------	6	10	2	9	38	12	------	2	------	------	112
Alexandria	11	16	------	1	3	------	4	31	7	------	1	------	------	74
Alleghany	5	26	------	1	1	2	2	12	9	------	14	------	------	72
Amelia	2	4	------	------	------	------	------	1	------	------	6	------	1	14
Amherst	5	8	------	1	1	------	------	4	1	------	2	------	------	22
Appomattox	------	1	------	3	1	------	3	1	1	------	1	------	------	11
Augusta	9	30	------	5	7	1	6	20	2	------	4	------	------	84
Bath	4	8	------	5	10	1	------	7	5	------	------	------	1	41
Bedford	7	17	------	6	3	------	------	2	2	60	251	67	------	415
Bland	3	1	------	------	1	------	2	------	1	1	------	1	------	10
Botetourt	9	29	------	5	4	------	1	5	------	------	2	2	------	57
Brunswick	2	9	1	------	------	------	------	9	1	355	356	39	------	772
Buchanan	------	1	------	------	------	------	------	------	------	------	------	------	------	1
Buckingham	3	3	------	------	1	------	1	2	------	------	1	------	------	11
Campbell	8	17	------	1	3	------	9	38	9	150	641	146	1	1,023
Caroline	5	29	------	9	8	------	9	16	1	34	50	6	3	170
Carroll	10	18	------	2	1	------	3	8	2	------	------	------	------	44
Charles City	------	------	------	------	------	------	------	------	------	------	5	------	------	5
Charlotte	1	11	------	------	4	------	6	32	4	13	46	6	7	130
Chesterfield	6	11	------	5	8	------	8	18	6	------	7	2	8	79
Clarke	1	2	------	2	4	------	------	6	------	------	------	------	------	15
Craig	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Culpeper	4	5	------	------	------	------	3	5	2	------	2	------	1	22
Cumberland	------	2	------	------	------	------	------	4	1	------	4	------	------	11
Dickerson	------	1	------	------	------	------	2	1	1	------	------	------	------	5
Dinwiddie	31	81	------	11	38	4	15	135	26	1	11	------	11	364
Elizabeth City	3	7	------	7	10	1	2	16	2	------	1	------	1	50
Essex	1	6	1	2	1	------	------	5	------	257	251	45	------	569
Fairfax	3	2	------	------	1	------	------	2	1	11	21	3	2	46

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TABLE II—CONTINUED.

COUNTY	TUBERCULOSIS			DIPHTHERIA			TYPHOID FEVER			HOOKWORM			Miscellaneous	Total
	Pos.	Neg.	Atyp	Pos.	Neg.	Atyp	Pos.	Neg.	Atyp	Pos.	Neg	Other para-		
Fauquier	8	22	------	3	18	------	6	20	5	------	16	5	3	106
Floyd	6	13	------	------	1	------	1	8	1	------	2	------	------	32
Fluvanna	3	9	------	7	5	------	2	20	4	------	11	------	------	61
Franklin	5	19	------	------	------	------	------	3	------	161	252	40	------	480
Frederick	3	5	------	5	8	------	1	5	1	------	------	------	------	28
Giles	3	4	------	1	2	1	------	3	------	------	------	------	3	17
Gloucester	------	1	------	------	------	------	------	------	------	2	6	1	------	10
Goochland	1	3	------	------	------	------	2	1	1	------	2	1	------	11
Grayson	7	20	------	------	------	------	2	6	1	------	------	2	------	38
Greene	1	1	------	------	------	------	------	1	------	------	------	------	------	3
Greensville	------	10	------	3	2	------	3	11	------	296	296	46	11	672
Halifax	16	36	------	8	11	1	6	24	6	133	170	12	------	423
Hanover	3	8	------	23	54	2	4	29	8	10	25	8	18	192
Henrico	25	63	1	129	555	13	5	41	14	------	15	------	19	880
Henry	1	5	------	------	2	------	------	5	3	------	7	------	------	23
Highland	2	1	------	------	------	1	------	1	1	------	------	------	1	7
Isle of Wight	6	9	------	2	3	------	3	18	2	1	1	------	------	45
James City	4	15	------	28	56	3	2	23	2	5	13	------	------	151
King and Queen	------	4	------	8	5	1	1	16	------	4	17	1	------	57
King George	------	------	------	------	------	------	------	------	------	56	68	54	------	178
King William	3	10	------	5	1	------	7	20	4	11	31	------	------	92
Lancaster	2	2	------	3	5	------	2	15	3	2	79	17	------	130
Lee	4	26	------	3	5	------	3	10	4	37	29	51	------	172
Loudoun	8	13	1	3	13	3	2	30	3	------	3	2	1	82
Louisa	3	11	------	------	2	------	4	28	5	------	5	------	3	61
Lunenburg	3	9	------	1	1	------	1	3	7	25	46	10	1	107
Madison	2	2	------	------	------	------	1	1	1	1	5	------	------	13
Mathews	2	1	------	------	------	------	------	------	------	4	65	15	------	87
Mecklenburg	1	16	------	17	21	1	10	32	10	333	427	123	------	991
Middlesex	1	7	------	20	14	6	2	4	1	67	197	44	------	363
Montgomery	3	26	------	2	2	1	7	39	17	1	6	7	2	113
Nansemond	1	5	------	1	7	4	7	37	6	------	2	------	------	70
Nelson	5	15	------	------	1	------	3	16	4	2	8	------	3	57
New Kent	------	2	------	3	3	1	------	3	1	4	5	1	------	23
Norfolk	3	13	------	4	11	1	4	17	8	3	52	11	2	129
Northampton	1	9	------	2	10	1	1	10	1	1	9	1	------	46
Northumberland	3	2	------	2	1	1	1	2	1	------	4	------	------	17
Nottoway	2	3	------	------	------	------	------	4	1	4	10	7	------	31
Orange	9	20	------	------	------	------	------	9	------	------	5	1	------	44
Page	2	8	------	4	2	------	1	20	3	------	------	------	------	40
Patrick	4	13	------	------	------	------	------	------	------	2	1	1	------	21
Pittsylvania	16	58	1	2	8	------	9	23	4	13	44	7	------	185
Powhatan	------	8	------	------	------	------	1	3	------	------	1	------	------	13
Prince Edward	5	20	------	4	2	1	2	11	6	1	15	2	------	69
Prince George	3	2	------	------	1	------	2	14	------	------	------	------	1	23
Princess Anne	4	3	1	1	3	------	------	1	1	------	4	------	------	18
Prince William	4	4	------	1	1	------	1	9	2	------	1	------	------	23
Pulaski	9	9	------	1	4	------	1	9	2	------	3	2	------	40
Rappahannock	6	4	------	6	4	1	------	------	------	------	------	------	------	21
Richmond	1	5	------	6	7	------	------	4	------	1	1	------	1	26
Roanoke	8	30	------	3	2	------	12	43	6	3	4	5	14	130
Rockbridge	4	21	------	4	10	------	2	19	3	------	8	1	------	72
Rockingham	14	75	1	10	12	1	10	30	14	------	4	------	2	173
Russell	------	14	------	------	------	------	2	5	------	------	------	3	1	25
Scott	7	9	------	------	------	------	1	3	1	------	------	------	------	21
Shenandoah	9	14	------	------	------	------	1	7	4	------	3	------	------	38
Smyth	9	20	------	1	------	------	9	40	8	1	8	7	------	103
Southampton	2	24	------	16	14	1	10	27	6	29	47	7	------	183
Spotsylvania	4	9	------	------	1	------	5	19	6	------	4	------	1	49
Stafford	------	------	------	------	------	------	------	------	------	------	4	1	------	5
Surry	2	9	------	3	5	3	3	5	1	------	2	1	------	34
Sussex	3	7	------	1	3	------	7	15	2	1	6	------	------	45
Tazewell	1	3	------	13	34	1	3	16	1	------	------	------	------	72
Warren	------	2	------	------	------	------	------	4	3	------	2	------	------	11
Warwick	24	66	------	10	12	5	3	23	4	------	4	------	2	153
Washington	9	14	1	------	3	------	1	12	1	------	------	------	2	43
Westmoreland	1	7	------	9	1	------	------	10	2	30	36	8	1	105
Wise	10	17	------	1	------	1	4	16	11	1	3	2	------	56
Wythe	8	27	------	------	------	1	------	4	1	------	2	2	2	47
York	1	2	------	------	------	------	1	------	1	------	------	------	------	5
Miscellaneous	------	------	------	------	------	------	------	------	------	------	------	------	1,190	1,190
Total	460	1,328	8	454	1,070	68	271	1,357	310	2,124	3,772	826	130	------
		1,796			1,988			1,938			6,722		1,320	13,368

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TABLE III.

Statement Showing the Number of Persons Given Anti-Rabic Treatment, Their Age, Sex, Race and Residence, with the Nature of the Wound, the Means of Suspected Infection, and the Date of Initial Treatment.

DATE	Sex	Age	Color	Location of injury	By what animal	Residence
1911						
October 5th	M.	------	W.	Hand	Dog	Roanoke county.
October 13th	M.	------	W.	Hand	Dog	Caroline.
October 13th	M.	12	C.	Hand	Dog	Wythe.
October 13th	M.	------	W.	Hand	Calf	Roanoke.
October 23d	M.	12	W.	Leg	Dog	Brunswick.
November 1st	F.	------	W.	Leg	Dog	Pittsylvania.
November 2d	M.	------	W.	Leg	Dog	Botetourt.
November 12th	F.	8	C.	Leg	Dog	James City.
November 18th	M.	33	W.	Leg	Dog	Roanoke.
November 19th	M.	7	W.	Arm and hand	Dog	Richmond.
November 19th	M.	3	W.	Arm and hand	Dog	Richmond.
November 23d	F.	12	W.	Hand	Dog	Nelson.
December 3d	F.	70	C.	Hand	Dog	Dinwiddie.
December 4th	M.	11	W.	Leg	Dog	Hanover.
December 23d	M.	7	C.	Lip	Dog	Church Road.
1912						
February 8th	M.	9	W.	Leg	Dog	Lynchburg.
February 10th	M.	25	C.	Hand	Dog	Shawsville.
February 14th	M.	56	W.	Hand	Dog	Roanoke.
February 24th	M.	24	W.	Hand	Dog	Nelson.
March 7th	M.	17	W.	Hand	Dog	Petersburg.
March 8th	F.	8	W.	Hand and leg	Dog	Petersburg.
March 11th	F.	10	W.	Arm	Dog	Danville.
March 13th	M.	32	W.	Finger	Dog	Nelson.
March 22d	M.	12	W.	Hand	Dog	Danville.
March 27th	F.	11	W.	Hand	Dog	Patrick.
April 4th	F.	7	C.	Ankle	Dog	Dinwiddie.
April 4th	F.	12	C.	Wrist	Dog	Henrico.
April 11th	M.	3	W.	Face	Dog	Petersburg.
April 20th	M.	4	W.	Face	Dog	Petersburg.
May 3d	M.	5	W.	Cheek	Dog	South Richmond.
May 3d	M.	13	W.	Face	Dog	Floyd.
May 3d	M.	11	C.	Ankle	Dog	Caroline.
May 4th	M.	7	W.	Face	Dog	Franklin.
May 12th	F.	6	W.	Arm	Dog	Essex.
May 12th	M.	3	W.	Hand	Dog	Essex.
June 1st	M.	29	W.	Wounded and exposed to infection from patient suffering from rabies.		Patrick.
June 1st	F.	24	W.			Patrick.
June 1st	M.	3	W.			Patrick.
June 1st	M.	5	W.			Patrick.
June 1st	F.	27	W.			Patrick.
June 1st	F.	13	W.			Patrick.
June 1st	F.	18	W.			Patrick.
June 1st	F.	47	W.			Patrick.
June 1st	M.	15	W.			Patrick.
June 1st	M.	10	W.			Patrick.
June 1st	F.	7	W.			Patrick.
June 1st	M.	5	W.			Patrick.
June 1st	M.	3	W.			Patrick.
June 2d	M.	10	W.	Foot	Dog	Danville.
June 6th	F.	6	W.	Leg	Dog	Orange.
June 26th	M.	44	W.	Hand	Dog	Ashland.
July 1st	F.	8	W.	Leg	Cat	South Richmond.
July 1st	F.	6	W.	Hand	Cat	South Richmond.
July 2d	F.	11	W.	Finger	Dog	Caroline.
July 3d	M.	11	W.	Hand	Cat	South Richmond.
July 4th	M.	5	W.	Hand	Cat	South Richmond.
July 5th	M.	9	W.	Foot	Dog	Nottoway.
July 5th	M.	7	W.	Hand	Dog	Roanoke.
July 5th	F.	10	W.	Leg	Dog	Roanoke.

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TABLE III—CONTINUED.

DATE	Sex	Age	Color	Location of injury	By what animal	Residence
July 5th	M.	34	W.	Hand	Dog	Roanoke.
July 5th	M.	8	W.	Leg	Dog	Roanoke.
July 5th	M.	2	W.	Ankle	Dog	Roanoke.
July 5th	M.	38	W.	Hand	Dog	Roanoke.
July 6th	M.	12	W.	Arm	Dog	Caroline.
July 6th	M.	9	W.	Arm	Dog	Caroline.
July 6th	F.	7	W.	Arm	Dog	Caroline.
July 7th	M.	40	W.	Leg	Dog	Patrick.
July 9th	F.	6	W.	Leg	Dog	
July 10th	M.	42	W.	Thigh	Dog	Richmond.
July 11th	M.	5	W.	Leg	Cat	Caroline.
July 11th	F.	3	W.	Arm	Cat	Caroline.
July 11th	F.	2	W.	Leg	Cat	Caroline.
July 11th	M.	18	W.	Hand	Dog	Richmond.
July 13th	M.	15	W.	Foot	Dog	King and Queen.
July 17th	M.	19	W.	Lip	Dog	Alleghany.
July 18th	F.	17	W.	Hand	Dog	Hanover.
July 18th	M.	12	W.	Hand	Dog	Hanover.
July 18th	F.	10	W.	Hand	Dog	Hanover.
July 18th	F.	9	W.	Leg and hand	Dog	Hanover.
July 24th	M.	54	W.	Hand	Dog	Hanover.
July 27th	F.	6	W.	Back & but'cks	Dog	Caroline.
July 28th	M.	14	C.	Forearm	Dog	Roanoke.
July 28th	F.	10	W.	Forearm	Dog	Roanoke.
August 23d	M.	32	W.	Hand and back	Dog	Louisa.
August 25th	F.	32	W.	Hand	Dog	Alleghany.
August 27th	M.	8	W.	Abdomen	Dog	Hanover.
September 1st	M.	13	W.	Breast	Dog	Richmond.
September 3d	F.	3	C.	Ankle	Cat	Nottoway.
September 4th	M.	45	C.	Hand	Dog	Como, N. C.
September 4th	F.	8	W.	Face and hand	Dog	Chesterfield.
September 6th	F.	8	W.	Wrist	Cat	Mecklenburg.
September 7th	M.	11	C.	Dorsum, hand	Cat	Charlotte.
September 13th	M.	12	W.	Arm	Dog	Caroline.
September 16th	M.	9	W.	Leg	Dog	Henrico.
September 29th	M.	10	W.	Back	Dog	Essex.

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Report of Hampton Investigation.

July 1, 1912.

DR. ENNION G. WILLIAMS,
State Health Commissioner,
Richmond, Va.

DEAR SIR:

In accordance with your instructions, we submit herewith a report covering our investigation of the discharge of sewage into the waters of Hampton flats. The purpose of this investigation was to determine the location of the different sewer outlets, the approximate daily volume of the sewage discharged and especially to determine the feasibility of purifying crude sewage by disinfecting with hypochlorite of lime.

DESCRIPTION OF HAMPTON FLATS.

As shown on the accompanying map, No. 1, Hampton flats are situated between Newport News and Old Point. The shore line makes a deep curve to the north of a straight line drawn from Newport News' Point and Old Point. The waters form a part of Hampton Roads.

Hampton flats comprise an area of about seven square miles, or 4,500 acres. The shore line for the most part is regular and slopes gradually until at about one-fourth of a mile out the depth of water at low tide is eight to ten feet. With the exception of two sandbars, the rest of the area is nearly level, the water depth at low tide varying from ten to twelve feet. From the outer boundary of the flats the bottom slopes abruptly into the main channel of Hampton Roads.

As indicated by the map, there are three tributaries which empty into the waters of Hampton flats—Salter's creek, Hampton creek and Mill creek.

OYSTER GROUNDS.

The Hampton flats area is most suitable for the growth and cultivation of oysters. The waters are shallow and bottom is sandy and level. For the most part the oysters are planted, the seed being secured from beds farther up the James river.

All the grounds of Hampton flats are leased from the State at a yearly rental of one dollar per acre. At the present time the beds cover an area of about 3,500 acres and are cultivated at their maximum capacity.

OYSTER INDUSTRY.

That the Hampton flats' oyster industry is a most important one to the Commonwealth, and especially to the people in Hampton and vicinity, is indicated by the following:

Invested in planted oysters, oyster grounds, houses, boats and other equipment	$674,000

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Estimated average yearly expense:

1. Labor in the gathering and marketing of oysters. This includes the dredging, tonging, shucking, packing, etc....	$ 59,600
2. Labor in planting seed oysters, which includes boat hire and labor for catching.....	53,000
Total yearly expense.....	$112,600

That a considerable number of people depend for a livelihood on the oyster industry is shown by the fact that between 500 and 600 laborers are employed. At least ninety-five per cent. of these people live in Hampton or the immediate vicinity.

DISINFECTION OF CRUDE SEWAGE.

The investigation showed that the conditions around Hampton flats are not favorable for the adoption of any of the older processes for the purification of sewage. The arrangement of the several sewerage systems would make impracticable the installation of filteration beds.

A number of experiments performed recently indicate that disinfection by hypochlorite of lime is particularly efficient when applied to effluents from filters; and also has merit when applied to effluents from sedimentation tanks and will accomplish much toward the disinfection of even crude sewage. The chief difficulty in sterilization of crude sewage from small towns and institutions is due to the presence of large particles which the chlorine is unable to penetrate. For this reason it was thought advisable to determine carefully the local condition of a given case and perform a series of tests under actual working conditions before assuming that the process would be efficient.

Therefore, as a necessary part of this investigation, it was decided to make a thorough test of the process of operating a temporary disinfecting plant at the Hampton Normal and Agricultural Institute. The pumping station and the storage tanks were favorably arranged for this work. If the tests should indicate a substantial removal of the bacteria from this sewage, which was received in a fresh state and contained large numbers of solid particles, we could recommend the general application of the process in the district under consideration.

THE HAMPTON NORMAL AND AGRICULTURAL INSTITUTE.

The Hampton Normal and Agricultural Institute is situated on the east side of Hampton creek opposite Hampton. It was first opened in 1868.

The grounds cover an area of 185 acres. There are 113 buildings, including instructors' cottages. The total population is approximately 1,500, of which about 1,000 are students boarding in the institute buildings.

The sewerage system is complete and is built on the separate plan. Storm drains and gutters are provided to take care of surface water. The main sewer, extending through the central part of the grounds, is of cast iron, varying from twelve to sixteen inches in size. The laterals are of tile.

The sewage flows by gravity to an intake chamber, from which it is pumped to two concrete storage tanks, each having a capacity of 50,000

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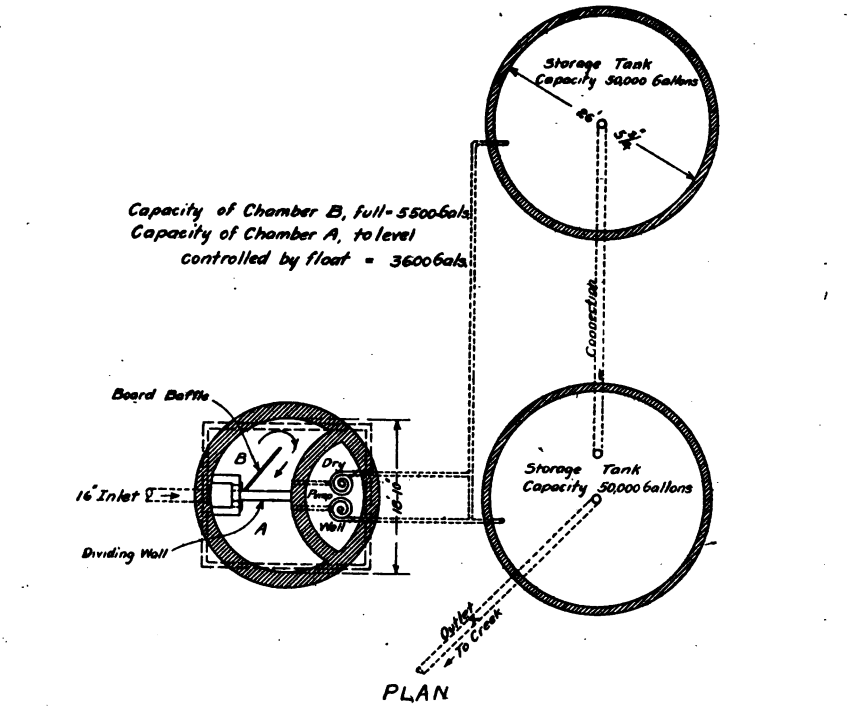

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gallons. The elevation of the bottom of the tanks is about seven feet above high tide level. Two centrifugal pumps, automatic and electrically operated, are provided for lifting the sewage. The tanks are emptied once or twice each day according to the rate of flow and the sewage discharged into Hampton creek off the point near the mouth of Jones creek, as shown in the plan. The purpose of the tank is to provide sufficient storage so that the sewage may be let out shortly after high tide.

The water consumption at the institute varies from 70,000 to 100,000 gallons per day. Ground water leakage increases the daily flow of sewage considerably. This fact is especially noticeable after a period of rain.

Description of Pumping Station and Storage Tanks.

The accompanying map (No. 2) shows the general plan, section and relative elevations. Sewage enters the intake chamber about twelve feet below the pump-house floor, and is admitted to either of the intake chambers, A or B, by opening one of the sluice gates. As shown on the plan, there are two centrifugal pumps in the dry well, one a six-inch and the other a five-inch. These are electrically operated and automatically controlled by floats. If one pump fails to start, the chamber fills, flows over the dividing wall into the other chamber and the other pump is put in operation.

The capacity of each of the chambers, A and B, up to the level at which the pump starts, is 3,600 gallons, and up to the top of the dividing wall 5,500 gallons. The six-inch pump has a capacity of 580 gallons per minute.

The plan shows in general the arrangement of the two concrete storage tanks. The numerous by-passes etc., are not shown. The tanks are circular, each 36 feet 5¾ inches in diameter, with a capacity of 50,000 gallons. The piping is arranged so that sewage from the pump flows into each simultaneously. The connecting pipe between the two allows the sewage to flow from D to C and out through the outfall pipe to the creek.

To insure mixing of the hypochlorite with the sewage and the maximum preliminary storage, a wooden baffle was put in as shown. The valves were adjusted to make the sewage from the 16-inch inlet enter chamber B, flow around the baffle, then over the dividing wall into A. The pump connected with B was out. This arrangement permitted a storage period in B of 40 to 65 minutes and in A of 26 to 40 minutes according to the rate of flow.

Description of Hypochlorite Plant.

The plant for mixing the hypochlorite solutions was set up as indicated. The details are shown on plan No. 3. Briefly, it consisted of a 50-gallon barrel with a hand-operated device for thoroughly mixing the solution; two hogsheads for holding the solution, one having a capacity of 100 gallons and the other 110 gallons, and an orifice feed tank controlled by a float valve. The orifice was graduated and carefully rated. Three-quarter inch brass valves and rubber hose was used for the connections between the parts. The solution was applied at the point where the sewage entered chamber B.

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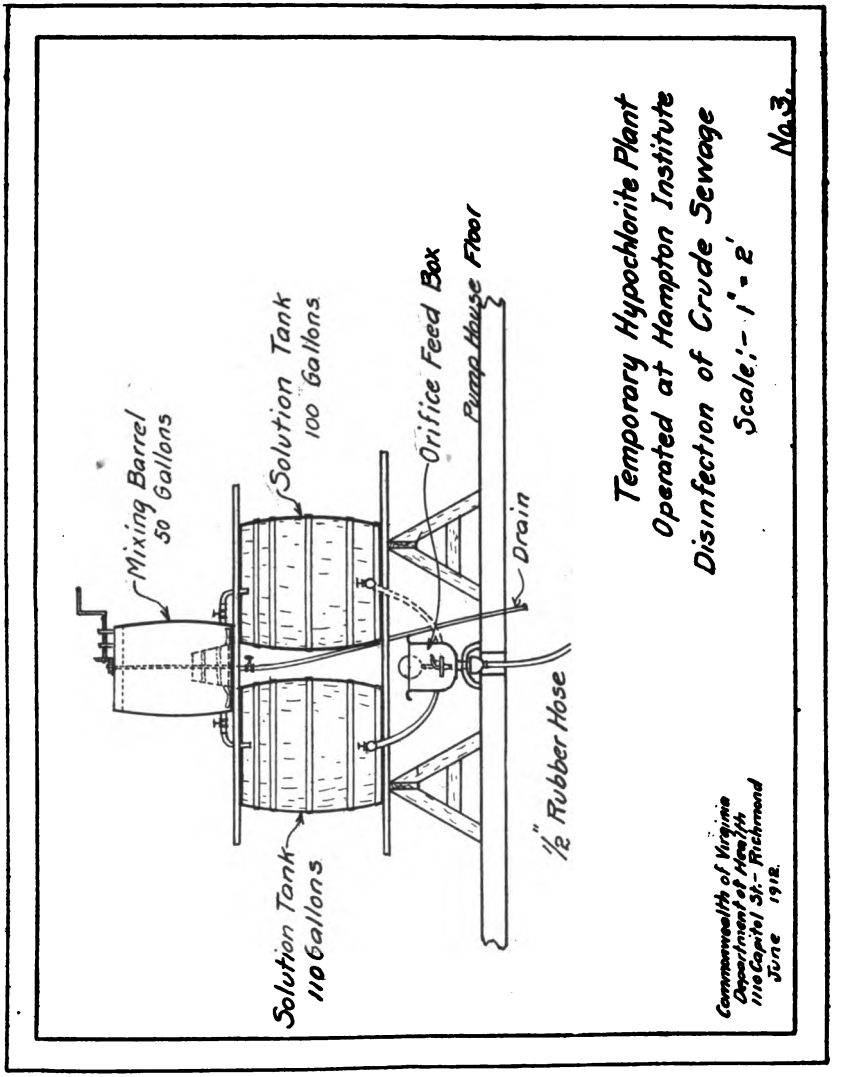

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Application of Hypochlorite.

The hypochlorite of lime used in these tests showed by analysis to contain from 35 to 36 per cent. of available chlorine. It was purchased in 25 pound containers at four cents per pound. The powder was tested frequently and analysis of the solution made for a check.

Previous experiments have shown the importance of careful mixing to avoid loss of chlorine. In this case a two per cent. solution was made up requiring 16.5 pounds of powder for one barrel and 18.3 for the other. From six to eight pounds of powder was poured into a two gallon bucket and sufficient water added to form a paste. More water was then added and the top portion poured into the barrel, leaving any coarse lumps in the bottom. The lumps were then broken up, water added and the process repeated until the required amount of powder was put in the mixing barrel. The paddle device gave further mixing. After standing in the mixing barrel for several hours, the solution was drawn off. Our analyses showed that by this method there was practically no loss.

Previous to starting operations the rate of sewage flow for different periods of the day had been determined by measurements in the storage tank. An indicator showing the number of times the pump operated during a given time was used as a check for any variation. It was not considered necessary to adjust the orifice to correspond with slight variations of flow during different periods. A general average was taken much the same as would be done in practice. However, at the end of a given run, the total pumpage was determined and the parts per million of chlorine was computed.

Disinfection of Crude Sewage at Hampton Normal and Agricultural Institute, Table Showing the Per Cent. of Bacteria Removed for Each Concentration of Chlorine.

DATE May 1912	Time Run	Hours Run	Flow in Gallons	Hypo. Added Lbs.	Available rine p. p. s. Chlo-	Total Number Bacteria per c. c. at 37° c.			Per Cent. Removed	
						Average Initial	After 1 hour contact Intake Chamber	Storage Tank Mixed Efflu.	One hour contact in Intake Tank	Storage Mixed Efflu. Tank
20-21	Night	16.3	77,800	18.	9.7	2,170,000	----------	2,500	--------	99.9
21	Day	7.4	56,000	9.3	7.0	----------	980	92,000	99.9	95.8
21-22	Night	16.5	78,000	6.9	3.8	2,330,000	----------	*540,000	--------	76.9
22	Day	8.0	51,000	11.4	9.4	----------	5,500	4,600	99.8	99.8
22-23	Night	15.7	79,000	6.5	3.5	3,100,000	----------	*448,000	--------	85.6
23	Day	7.2	46,400	10.	9.0	----------	110,000	192,000	96.4	93.8
23-24	Night	16.6	83,000	18.6	9.4	2,280,000	----------	194,000	--------	91.5
24	Day	5.6	37,500	16.5	18.6	----------	4,000	5,000	99.8	99.9
24-25	Night	16.6	77,500	25.00	13.6	2,125,000	----------	90,000	--------	95.8
25	Day	2.3	21,000	6.00	12.	----------	6,000	21,000	99.7	99.0
25	Day	4.2	25,000	10.6	17.8	----------	1,080	1,200	99.9	99.9
25-26	Night	16.0	71,700	25.00	14.6	1,910,000	----------	61,000	--------	96.8

*Orifice box clogged and only amount indicated was applied.

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SUMMARY AND CONCLUSIONS.

The tests at the Hampton Normal and Agricultural Institute demonstrate that ninety-five to ninety-nine per cent. of the bacteria may be removed from strong crude sewage by the application of ten to fifteen parts per million of available chlorine. These results obtained confirm the work done at experimental stations and actual plants in operation at other places.

At the present time there is a total population of about 16,500 on the areas drained by the sewers which discharge into the waters of Hampton flats. The whole district is favorably situated for rapid development.

That the valuable oyster grounds on Hampton flats may be threatened in the near future by the continued discharge of unpurified sewage is admitted. The rights of people interested in this great and valuable industry cannot be questioned. At the time these beds were established the contamination of the waters was not a serious factor.

It is not likely that the disinfection of sewage would render advisable or absolutely safe the gathering of oysters from areas nearer the sewer outlets than are used at present. However, it is not always possible to prevent dishonest individuals from catching oysters on forbidden ground and disposing of them to unsuspecting customers. Disinfection of sewage would diminish the danger of the consumption of such shellfish.

Besides protecting the oyster industry the interests of public health demand that this sewage shall be purified to a reasonable degree. During the summer months hundreds of pleasure boats of all kinds are seen on these waters, and the shores are used for bathing. Although the dilution of the sewage is considerable, there is always a real danger that from the thousands of pathogenic bacteria scattered through the waters some may find victims.

RECOMMENDATIONS.

Based on the facts as outlined in this report we submit the following recommendations:

1. That all sewage from the Salter's creek outlet, the district between Salter's creek and Hampton, Hampton, Phoebus, Hampton Normal and Agricultural Institute and National Soldiers' Home shall be disinfected by means of hypochlorite of lime before being discharged into the waters which pass over Hampton flats.

2. That the sewage from the above places will require from ten to fifteen parts per million of available chlorine. Hypochlorite of lime, more commonly known as bleaching powder, guaranteed to contain at least thirty-four per cent. available chlorine, may be purchased at a cost varying from twenty-five to thirty-five dollars per ton, depending on the size of the order. With this grade of bleaching powder there will be required for each 100,000 gallons of sewage treated twenty-five pounds of powder for ten parts per million and thirty-eight pounds for fifteen parts per million.

3. That all the plants shall be under the general supervision of a man trained along technical lines who will be responsible for the satisfactory operation of each. The efficiency of the process depends almost entirely on the faithful and intelligent manner by which the chemical solution is

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adjusted and applied. Systematic records should be kept concerning the daily flow of sewage, the reduction in the number of bacteria and especially as to the quality of the chemical used. If the plants are left to the care of unskilled attendants, we can give no assurance that the results accomplished will be satisfactory in protecting the waters of Hampton flats from pollution.

DESCRIPTION OF SEWERAGE SYSTEM OF THE TOWNS AND INSTITUTIONS IN THE VICINITY OF HAMPTON FLATS.

As stated at the beginning of this report, the purpose of the investigation in part was to determine the amount of sewage discharged which might tend to pollute these valuable oyster grounds and the location of the several outfalls. To this end all the sewer outlets were visited and such information as possible was secured in regard to the daily volumes of flow.

Newport News.—The population of Newport News as given in the last United States census report is 20,205, a figure probably low on account of a considerable floating population not included.

Newport News has a complete system of sewers, the sewage being conveyed by gravity to three separate outfalls. On account of topographical conditions, the system is divided into three separate units.

Within the boundary lines of Newport News there are approximately about thirty miles of streets, of which about twenty-seven miles, or ninety per cent., are sewered. A considerable percentage of the houses on sewered streets are not connected with the system.

From water consumption data it is estimated that the daily flow of sewage, not including ground water leakage, is approximately one million gallons, or less than fifty gallons per capita for the total population. On account of the soil stratification and the depths of sewers, the ground water leakage is considerable. Storm water from streets is not admitted into the system except at a few places where unavoidable.

The three outfalls are located at Thirty-fourth street, twenty-fifth street and Salter's creek.

The Thirty-fourth street sewer is twenty-four inches in size and extends out from the shore line about 1,100 feet, discharging in the main channel where the water is fifty feet in depth. The sewage which reaches this outfall is collected from the northwestern section of the city and comprises approximately forty-six per cent. of the average daily flow. On the basis of one million gallons total per day, the average discharge, exclusive of ground water, is 450,000 gallons.

The Twenty-fifth street sewer is sixteen inches in size and extends out from the shore line about 675 feet, discharging into about thirty feet of water. This unit includes the central portion of the city. About thirty-five per cent. of the total, or 350,000 gallons per day, exclusive of ground water, is discharged from this outfall.

The sewage from the eastern section of the city flows by gravity to the outfall which discharges into Salter's creek at a point about 1,000 feet north of the Boulevard street railway crossing. Formerly there was a lifting station by which the sewage was pumped to the Twenty-fifth street outfall. A few years ago the main sewer was laid to Salter's creek and the sewage lifting station abandoned. About twenty per cent. of the total, or 200,000

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gallons per day, exclusive of ground water, is said to be discharged into Salter's creek.

During several months in the year the volume discharged from the three outfalls is increased greatly by the infiltration of ground water, as above explained. On the day of the inspection, April 30, the estimated discharge at the Salter's creek outlet was at the rate of 400,000 per twenty-four hours.

Area Between Salter's Creek and Hampton.—Between Salter's creek and the western limits of Hampton there is a scattered population. The land is desirable for residential purposes and is developing rapidly. In the western section of this area the houses having plumbing fixtures are connected usually with cesspools. In the eastern section the residences near the shore have private sewers discharging into the water. Lately there has been constructed a sewer which will serve a considerable area. This is shown on the accompanying map.

Hampton.—The population of Hampton as given in the United States census report, 1910, is 5,505.

The sewerage system is incomplete and is divided into several units leading to differgent outfalls which discharge into Hampton creek. The total length of all the sewers is estimated to be about 4.1 miles, with about 325 connections.

The location of the various outfalls and the number of feet of sewers connected to each is estimated as follows:

1. Mallory avenue, twelve-inch outfall under east Hampton bridge, 4,200 feet of sewers.

2. East Queen street, twelve-inch outfall under Hampton creek bridge, 10,000 feet of sewers.

3. King street, ten-inch outfall near steamboat wharf, 2,000 feet of sewers.

4. Victoria avenue, twelve-inch outfall into Hampton creek, 15,600 feet of sewers.

The sewage is conveyed to each of the outfalls by gravity. Not more than twenty-five per cent. of the population is served at present, although in the near future local health ordinances will force more people to make connections. Many of the residences and business houses along the shore line have private sewers discharging into Hampton creek and the small inlets. All these taken in the aggregate form a considerable fraction of the whole pollution from Hampton.

Phoebus.—The population of Phoebus (United States census 1910) is 2,394, not including the floating population.

The sewerage system is incomplete. At present there are two units, the sewage flowing by gravity to two outfalls. Plans are under way for the addition of another unit within the next year or two.

One outfall discharges into Mill creek at the foot of Mellin street. This serves the southwestern and main part of the town and is connected with 7,700 feet of sewers.

The other outfall is connected with about 7,000 feet of sewers, which serve the northeast section of town, and discharges into Mill creek about 3,000 feet northeast of the first outfall.

Fortress Monroe.—The population of Fortress Monroe (United States

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census 1910) is 1,804, which, of course, is not accurate on account of the number of visitors during all months of the year.

The sewerage system is complete and was installed in 1895. It is built on the separate plan, storm drains being provided to take care of all surface water.

The daily flow of sewage is 450,000 gallons, which shows the high per capita consumption and a dilute sewage.

The sewage is collected in an intake well having a capacity of 235,000 gallons, from which it is pumped twice each day, one hour after high tide, to the outlet on the point east of the light. The depth of water off the point exceeds fifty feet.

National Soldiers' Home.—The Old Soldiers' Home is situated near the entrance of Hampton creek and overlooking Hampton roads. The total population on the grounds is about 2,700. The sewerage system is complete and built on the separate plan. Special storm water drains are provided for surface water. The system is divided into three units. The sewage is collected from each area in an intake well, from which it is pumped through the outfall pipe, discharging into Hampton Roads. One outlet is located about 600 feet south of the wharf at the mouth of Jones creek, and the other two discharge from the extreme southeastern point of the grounds. These are shown on the accompanying map.

The total daily flow is said to be from 175,000 to 200,000 gallons per day. The southeastern pumping station receives about twenty-five per cent. and the other two about thirty-eight per cent. each.

THE SOURCES OF SEWAGE POLLUTION OF THE WATERS WHICH COVER HAMPTON FLATS.

After a careful investigation it is our opinion that sewage from the following places tend to the pollution of the oyster grounds:

1. The Salter's creek outlet from Newport News.
2. Private sewer outlets between Salter's creek and Hampton.
3. Hampton.
4. Phoebus.
5. Hampton Normal and Agricultural Institute.
6. National Soldiers' Home.

The sewage from Fortress Monroe is not a factor in the pollution of the oyster grounds. The outlet discharges into deep water on the other side of Old Point. The sewage is pumped out one hour after high tide and carried so far out into the main channel that there is no danger of any pollution reaching the oyster grounds.

GENERAL DATA CONCERNING THE PROPOSED PLANTS.

It was not the purpose of this investigation to submit detailed information concerning the design and cost of construction of individual plants. Such work is left to some consulting engineer who may be employed by the authorities of the town or institution concerned.

However, from the investigation the following suggestions and remarks are offered concerning some of the principal engineering difficulties to be overcome in establishing disinfecting plants at the various places.

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Newport News—Salter's Creek.—The inspection indicated that there are no especial engineering difficulties to be overcome in the construction of a disinfecting plant for this sewer. The most favorable location seems to be at a point about 1,000 feet before the outlet is reached. The sewer serves a population of between 4,000 and 5,000 and the dry weather flow is not less than 300,000 gallons per day. The population on the area drained is likely to increase rapidly within the next few years.

Between Salter's Creek and Hampton—Private sewers from residences located along the shore between Salter's Creek and Hampton.—At present the amount is not sufficient to be a serious factor in the contamination. The property in this section seems favorably located for rapid development and the plans for a general sewerage system should be drawn with especial reference to providing purification of the sewage in the future. All the sewage should be collected in one system of pipes and conveyed to one outlet where a disinfecting plant may be located.

Hampton.—The physical features of this sewerage system will offer serious difficulties in the collection of all the sewage at one point for treatment. The system has been extended gradually as the town has grown and as a result there are four separate outfalls. In order to collect the sewage it will be necessary to reconstruct part of the system or install pumping stations. More detailed information and study as to grades and location of sewers will be necessary to determine which method will be cheaper. Another difficulty to be met is the excessive quantity of ground water which gains access to the system.

Phoebus.—The town of Phoebus has a population of about 2,500. Within the next few years the general sewerage should serve at least seventy-five per cent. of the population.

The problem here is not so difficult as at Hampton. There are two outlets, which will require two plants or one plant and a pumping station. In the extension of the sewerage system provision should be made for discharging the sewage at one of the present outlets if possible.

Hampton Normal and Agricultural Institute.—The population is about 1,500 and the dry weather flow of sewage is about 100,000 gallons per day.

The arrangement of the intake chamber and the storage tanks at the institution is favorable for the installation of disinfecting tanks and apparatus. The plant may be arranged in much the same way as the one set up for the experiments, shown on plans No. 2 and No. 3. The mixing and solution tanks should be of concrete. A plant very similar to the one required is in operation at the Newport News water plant.

National Soldiers' Home.—The population is about 2,700 and the dry weather flow of sewage is about 200,000 gallons per day.

At the Old Soldiers' Home there are three pumping stations and three separate outlets, as shown on plan No. 1. To disinfect the sewage it will be advisable to pump from two of these to the station located at the southeastern part of the grounds. This will require a new line of pipe about 1,700 feet in length and the enlargement of the tank in which the sewage will be collected.

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APPENDIX THREE.

Report of the Bureau of Publicity.

D. S. FREEMAN, Ph. D.,
Director in Charge.

The emphasis placed upon the work of this bureau in all the activities of the board rests on a fundamental belief in the efficacy of popular education. Knowing the character of our population and confident that general information means general prevention, the board has aimed, as far as its means permitted, to give to all the people of Virginia simple and accurate information as to how they might apply the great truths of modern sanitation.

From the first the policy of publicity laid down by the board has aimed at a comprehensive presentation of facts to all classes of our citizens. In brief, this policy has been (1) to publish frequent popular articles in the current press of the Commonwealth regarding the prevalence and prevention of disease, (2) to issue monthly bulletins in popular style detailing at length the precautions to be taken in the conquest of any communicable disease, (3) to furnish accurate scientific information along given lines to the medical profession, (4) to present in public lectures and addresses such truths of sanitation as seemed best suited to the needs of various audiences, and (5) to supplement these with such occasional literature and publicity as were demanded by special conditions.

THE PRESS SERVICE.

In accordance with the first purpose named above, we have maintained a weekly press service for the newspapers and periodicals of the State. While the details of this service were fully outlined in the bureau's annual report for 1910, frequent inquiries regarding our methods are still received and justify a brief re-estatement of our methods of procedure. We have proceeded upon the principal that the press of the Commonwealth, anxious to give news to the people and willing to aid in every good cause, will give generously of its space to the publication of public health news, provided this news conforms to the usual standards of journalism. It is unreasonable to expect any newspaper, except in rare instances, to print the bare details of prevention and it is not to be supposed that they will print whatever is sent them regardless of its form.

But if health news be supplied the press in available form, this news will generally be printed. Accordingly, the following rules guide us in preparing our press service:

1. Choose such subjects as have a public interest while carrying a definite health message.

2. Write these articles in newspaper form with a suitable "lead."

3. Supply these articles with headlines suited to the measure of standard newspapers.

4. Furnish these articles with a standard release date, so that every newspaper will have the opportunity of printing them as soon as any other paper in the State.

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Each of these rules is justified by our experience. The average paper aims to live up to its name—it is a *news*-paper, not a critical journal or an organ of propaganda. It wants the news and will print it. The average editor, for example, finds little of news in the fact that ice cream may carry the germs of typhoid fever, but he will be delighted to print that a specific epidemic of typhoid in his State was caused by infected ice cream. He will not be interested to know that the scratch of a cat may cause rabies, but he will display any story detailing how a citizen of his community contracted rabies from a cat scratch. This does not mean that the press service of a health department should be essentially a news service, but it does mean that the news feature must be emphasized and that the public health truth must be adroitly introduced.

Again, the article must be in regular journalistic form for obvious reasons. The editor of a paper is usually a very busy man upon whose space there are constant and insistent demands. He cannot afford to take the time necessary to "rewrite" a health article except in most unusual circumstances. If he is to print the article it must be sent him ready for the compositor. Newspaper writing, it must be remembered, is distinctly technical and is not governed by the usual rules of literary presentation. A Macauley essay or an Addisonian review finds no place in a modern daily paper. That which is presented for publication must be concise, clear, attractive and written in conformity with regular standards. In the judgment of the board, effective health publicity must be carried on by a man with practical newspaper experience; and where such a man is not available the writer who proposes to supply a press service should very carefully study newspaper style before attempting to "plant" his copy.

Furthermore, the headline is by no means the least important feature of a press service. An unheaded article bearing the earmarks of the multigraph or other duplicator generally finds its way from the editor's desk directly to the wastebasket. To receive attention it must appear to be news. This appearance can best be given by a headline, in proper form, giving the contents of the article. In addition, it is well to remember that if the headline "fits" the measure of a paper, it is more likely to be inserted than an article for which a headline must be written. And besides all this, it is well to remember that a headline of a given style may often be "planted" where, if the matter be left to the editor, a much less imposing head might be supplied. An editor will often run a "thirty point head" where, if he had to write one for an article, he would generally supply a "ten point."

The importance of a release date is obvious to any one who will consider the subject even casually. What the editor wants is news—something which has not previously appeared in any paper. He will not print, normally, an article which his rival has carried the day before. A standard release date for the entire territory covered solves this problem. Where there are both morning and afternoon papers to be served, an alteration of the release date from morning to afternoon, week by week or day by day, will be found helpful.

The mechanical side of a press service must not be neglected, as a lack of facilities may prevent the publication of an item until its news value is lost. The equipment used in the office of this bureau is not ideal, but it

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answers our needs at a very reasonable price. On the addressograph we keep the plates of all the newspapers in the State, with their proper addresses, which plates are revised from time to time. On Tuesday morning, our usual press-service day, while the copy is being written a clerk addresses envelopes on this machine to all the editors of the State. When the copy is ready it is set up on the multigraph by a clerk, with the usual headings, etc. Usually the chief article of the week and the two short articles following can be set and run in six hours. This done, it is only a matter of a few minutes to fold the sheets, insert them in the addressed envelopes and mail them. Our estimate is that the equivalent of a column of newspaper copy may be set up and placed in the mail by one skilled operator in a single day's work.

Applying these principles to our work in Virginia, it is a pleasure to report that during the past year our press service has met with continued success. At least a majority of the daily and weekly papers of the State print our notices in full whenever they are released, while the more important stories are printed in practically all the newspapers of the Commonwealth.

During the past year forty-five clipping sheets were sent out, covering ninety-eight items, as follows:

DIGEST OF WEEKLY CLIPPING SHEET OF THE STATE BOARD OF HEALTH.

October, 1911-*September*, 1912.

Release date.

October 5, 1911—Outline of precautions to prevent the spread of diphtheria.
Announcement of conclusion of typhoid fever investigation.

October 12, 1911—Digest of rules adopted limiting residence of patients at Catawba Sanatorium, with reasons therefor.
Reminder of arrangements for sale of antitoxin.
Details of fresh-air campaign.

October 18, 1911—Towns urged to forward reports of sanitary progress for annual report, with statement of value of such publicity.
Suggestion to local boards of health to keep antitoxin in stock.
Announcement of forthcoming bulletin on fresh air.

October 26, 1911—Notice that prosecutions will follow violation of sanitary regulations.
Report of proposed sanitary improvements in Norton and Gordonsville.
Itinerary of the State's hookworm exhibit.

October 27, 1911—(Special release) Statement as to the sanitary quality of Virginia oysters.

November 2, 1911—Quarantine regulations defended in court successfully.
Explanation of reasons for these precautions.
Remarkably low death rate of Roanoke.

November 16, 1911—Publication of Fresh Air bulletin.
Program of State Conference of Charities.
Christmas seals to be sold in State.

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November 23, 1911—Report of another successful prosecution for violation of State sanitary regulations.

Reported reduction in number of cases of tuberculosis in Virginia.

Further details of State Conference of Charities.

December 7, 1911—Necessity of enacting a law for the report of births and deaths.

Red Cross seals on sale in many localities.

Proposed enlargement of Richmond tuberculosis sanatorium.

December 14, 1911—Y. M. C. A.'s promise support to public health movement.

What Red Cross seals mean to public health.

Fresh Air bulletin in great demand.

December 21, 1911—State hotel inspection law held constitutional.

Final announcement of Red Cross seal sale.

January 4, 1912—Catawba Relief Association will meet conditions of generous gift for its benefit.

Smallpox prevalent in many parts of State; vaccination urged.

January 11, 1912—Quarantine regulations adopted for the control of scarlet fever.

Assembly to be asked for free antitoxin.

Hotel directory issued.

January 18, 1912—How proposed vital statistics law will aid help work.

January 25, 1912—Health authorities express approval of Drewry bill for registration of births and deaths.

Tuberculosis day to be observed in colored schools.

February 1, 1912—Lawyers show value of proposed vital statistics law and urge its adoption.

Final arrangements for colored tuberculosis day.

February 8, 1912—How vital statics law will make health work more effective.

Success of colored tuberculosis day assured.

February 15, 1912—Health officer touring State with farmers' institute trains and explaining principles of rural sanitation.

Reported progress in State's campaign against consumption.

February 21, 1912—Kansas Board of Health reprints the Virginia health almanac.

Warning against undue exposure to severe weather.

February 29, 1912—Reported activity in towns planning new sewerage systems.

Health almanacs may be had by those desiring them.

March 14, 1912—Announcement of enactment of vital statistics law and statement of its contents.

Farmers urged to repair private privies and to protect wells.

March 21, 1912—Announcement of plans for State's campaign against typhoid fever.

New edition of health almanac ready for distribution.

March 28, 1912—The importance of birth registration as instanced in the experience of a Virginia negro anxious to marry in Roumania.

April 4, 1912—How the vital statistics law will aid in pure elections.

Tubercuolsis campaign for cities.

Movements of typhoid investigators.

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April 11, 1912—The demographical importance of vital statistics in explaining the loss of population in rural Virginia.

Hookworm infection demonstrated by school examinations.

April 18, 1912—Plans for reception hospital for the Catawba Sanatorium.

Virginia's committee for the International Congress of Hygiene and Demography.

Importance of an early start in fighting flies.

April 25, 1912—Announcement of hookworm infection in eighty-five counties of Virginia.

Publication of vital statistics bulletin.

Plans for tuberculosis Sunday.

May 2, 1912—Importance of birth registration shown in experience of western girl who lost fortune because she could not procure birth certificate.

Hookworm dispensaries announced for counties which will make appropriation.

May 9, 1912—Warning of large number of rabid animals at large.

May 16, 1912—Report of first births registered in Virginia under the new law.

Preliminary announcement of typhoid fever investigations.

May 23, 1912—Details of State's arrangements to combat typhoid fever.

Smallpox reported in Hanover county.

May 30, 1912—Details of proposed enlargements of the Catawba Sanatorium.

Preliminary announcement of bulletin on the "Wary House Fly."

June 6, 1912—Report of interest in and speedy enforcement of vital statistics law.

Warning regarding the shipment of the heads of rabid animals.

June 13, 1912—Details of how a birth certificate aided an Englishman, temporarily resident in Virginia.

Request for speedy report of typhoid outbreaks.

June 20, 1912—Report of first death recorded in Virginia under new law, with explanation of importance of death registration.

Appointment of Dr. K. E. Miller as field inspector.

July 3, 1912—Special warning for "sane Fourth" celebrations.

July 11, 1912—Directions for comfort in hot weather.

Twenty persons being treated in laboratory to prevent rabies.

July 18, 1912—Preliminary statement of low typhoid rate with statement of necessary precautions to prevent the spread of the disease.

Publication of new vital statistics regulations.

Announcement of bulletin on care of infants.

August 1, 1912—Report of success of hookworm dispensaries with suggestions as to importance of treatment.

Further details of favorable typhoid outlook.

Notice of new publications ready for distribution.

Warning as to appearance of infantile paralysis.

August 8, 1912—Explanation of typhoid investigation in progress with suggestions as to prevention.

Report of smallpox in several counties, with warning.

August 15, 1912—Report of notable reduction in typhoid and of methods by which this was achieved.

August 22, 1912—Special warning to prevent typhoid with directions for general use.

Dispensaries treating many cases of hookworm disease.

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September 5, 1912—Progress of vital statistics registration and necessity of recording all births and deaths.

Attention directed to antitoxin rules and warning given of expected appearance of diphtheria.

September 12, 1912—Special notice of typhoid during last three months with explanation of method by which rate was reduced.

September 19, 1912—Warning as to necessity of sanitation in public schools. Notice of publication of annual register of physicians, etc.

Estimating that each of these items was printed but fifty times—a very low estimate—the State presented to the public 4,900 separate health messages. Computing the average circulation of each paper at 1,000—again a low estimate—a total of 4,900,000 health notices reached the citizens of Virginia.

The board wishes in this connection to renew its thanks to the press of the Commonwealth for their generous co-operation in giving this publicity to the truths of health work. Believing that the education of the people is responsible for the recent great advances in public health in Virginia, we feel that much of the credit for this is due the editors and publishers of the Commonwealth. Virginia has always been proud of her free press and never had a more striking instance of their public service than their contribution to the health of the people.

THE VIRGINIA HEALTH BULLETIN.

The second channel of publicity for health work in Virginia is the Virginia Health Bulletin, issued regularly by the board. During the past fiscal year ten regular bulletins and three extra numbers were printed as follows:

Contents of Bulletin from October, 1911, to September, 1912.

October-November, 1911 (Vol. 3, Nos. 10-11)—Fresh Air in Prevention and Cure.

December, 1911 (Vol. 3, No. 12)—The War On Disease—Papers Read Before the Public Health Association of Virginia, October, 1911.

January-February, 1912 (Vol. 4, Nos. 1-2)—Virginia Health Almanac, 1912.

March, 1912 (Vol. 4, No. 3)—Tuberculosis Catechism for Beginners. (Third edition.)

April, 1912 (Vol. 4, No. 4)—Why Vital Statistics Are To Be Registered in Virginia.

May (Vol. 4, No. 5)—The Simple Truth About Hookworm Disease in Virginia.

May 25 (Vol. 4, extra No. 1)—The Fundamentals of Farm Sanitation.

June (Vol. 4, No. 6)—The Wary House Fly.

July (Vol. 4, No. 7)—The Mother and the Child.

July 15 (Vol. 4, extra No. 2)—The Law for the Registration of Births and Deaths With Regulations and Suggestions for Registrars, etc.

August (Vol. 4, No. 8)—Typhoid Fever, the Virginia Scourge.

August 5 (Vol. 4, extra No. 3)—Why Births and Deaths Are Recorded in Virginia. (Second edition.)

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September (Vol. 4, No. 9)—Register of Physicians in Private Practice With a List of Health Officers and a Roster of Registrars of Births and Deaths.

The editions of these bulletins were as follows:

Fresh Air	40,000
The War On Disease	5,000
Health Almanac	40,000
Tuberculosis Catechism	20,000
Vital Statistics	15,000
Hookworm Disease	40,000
Farm Sanitation	30,000
The Wary House Fly	30,000
The Mother and the Child	30,000
Vital Statistics, Law, etc	15,000
Typhoid Fever	30,000
Vital Statistics (second edition)	30,000
Register of Physicians	7,000
Total circulation	332,000

Most of these bulletins have been distributed, as the policy of the board has been to print only those bulletins which might reasonably be sent out, on popular demand, within one year. We feel that constant advances of sanitary science render it necessary to revise our literature with frequency and we believe that a new bulletin on a given subject will much more widely be read than an old edition.

It may not be improper to remark that the board has received numerous letters of commendation regarding its bulletins, and, in particular, has received many congratulations on the Health Almanac (Vol. 4, Nos. 1-2) and on the vital statistics number (Vol. 4, No. 4). In this State, it will be recalled, was originated in 1911 the idea of a health almanac and our effort has been to improve this bulletin with succeeding issues. Our almanac for 1911 was reprinted in 1912 by the Kansas and Mississippi boards of Health and excerpts from it were given wide circulation in some of the best known journals and newspapers. The demand for the 1912 bulletin was widespread and requests for copies were received from the Canal Zone, from France, from Zanzibar and from Australia, as well as from practically every quarter of America. The request received at the office, following a commendatory note in Colliers' Weekly (April 6, 1912), were so numerous that we tabulated the requests received in one day's mail. These were as follows:

Fort Smith, Ark.,	Sioux City, Iowa,	Portland, Me.,
Denver, Col.,	McCracken, Kan.,	Arlington, Minn.,
La Grange, Ga.,	Wellington, Kan.,	Dayton, Ohio (2),
Sumner, Ga.,	Henderson, Ky.,	Elysia, Ohio,
Indianapolis, Ind. (2),	Everett, Mass. (2),	Cisco, Tex.,
Paoli, Ind.,	Boston, Mass.,	Hamlin, Tex.,
Chicago, Ill.,	Ipswick, Mass.,	Salem, Va.
Pekin, Ill.,	Lynn, Mass.,	

Total number of bulletins requested, 478.

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Our vital statistics bulletin likewise attracted attention and was favorably commented upon by Dr. C. L. Wilbur, Chief of the Division of Vital Statistics, Bureau of the Census. The demand for this bulletin was so great that we were forced to issue a second edition.

INFORMATION FOR SCIENTIFIC WORKERS.

The preparation of literature for scientific workers has not come within the work of this bureau, but has been in charge of the various officers of the board. During the past year members of the staff have spoken before a number of local medical societies in Virginia, the Virginia Medical Society, the Seaboard Medical Society, the Southern Medical Association, the American Public Health Association, the XV International Congress of Hygiene and Demography, the Annual Conference of State and Provincial Health Officers and other scientific bodies. Papers by members of the staff have been printed in Virginia Medical Semi-Monthly, The American Journal of Public Health, the Journal of the American Medical Association, the Proceedings of the XV International Congress of Hygiene and Demography, the Charlotte Medical Journal, the Southern Medical Journal, the Proceedings of the Southern Sociological Congress, the Proceedings of the State Conference of Charities, the report of the Tennessee State health department and other publications.

The policy of the board has been to encourage scientific contributions by members of the staff insofar as the demands of our work will permit. It is the belief of the board that the results of work in Virginia should be made known to the scientific world and that we should do our part towards the establishment of that interstate comity and co-operation which are essential to successful health work.

LECTURES BY THE MEMBERS OF THE STAFF.

Our fourth method of publicity is through public lectures delivered wherever opportunity affords without prejudice to routine duties. This is a most valuable channel of communication with the public and permits of a close contact lacking through more formal publicity. Our lectures have covered a wide range of public health work and have been shaped, as far as possible, to meet the needs of the communities to which they were addressed. No precise record of the number of lectures and addresses so delivered has been kept, but the number during the past year has exceeded that of any previous year. Among the lectures were a series delivered by Assistant Commissioner Freeman on all the farmers' institute trains, a series delivered by Commissioner Williams in Southwest Virginia, and a series delivered by another member of the staff at most of the summer normal schools.

As this report goes to press a list of the lectures delivered by members of the staff is being prepared and will be issued during the next few weeks. This will be in the form of a special number of the bulletin and will outline most of the lectures available.

SPECIAL PUBLICITY CAMPAIGNS—THE TYPHOID CAMPAIGN.

Obviously no formal outline of publicity work, however comprehensive, can provide for all the contingencies that will arise. Special arrangements

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are often necessary to meet particular needs. Such a need is found every year in our preparations for the appearance of certain communicable diseases, and as the plans for the typhoid campaign are typical of those employed in such cases, an outline of the publicity employed may not be without interest.

Experience has shown that if we are materially to reduce the typhoid in Virginia we must begin our publicity well in advance of the first summer cases. Accordingly, during the early spring we laid much emphasis on the importance of providing sanitary water supplies and sanitary privies. Repeated newspaper notices were supplemented during the past summer by the publication of bulletins on farm sanitation and hookworm disease, in both of which the "gospel of the sanitary privy" was preached at length. Through the foresight of the bureau of rural sanitation (Dr. A. W. Freeman), a large supply of the farmers' bulletin on the sanitary privy was secured from Washington and was sent to select rural addresses in Virginia. Special lectures were given in infected localities, warnings were published that the control of the disease depends upon prompt precautions, a large number of display mailing cards were sent out urging interested persons to write for details as to "how to prevent typhoid," physicians were urged to make prompt report of all cases. Line upon line and at every available opportunity these truths were reiterated and when the first summer month's returns showed a very mild typhoid situation this fact was cited to show the possibilities of prevention. Our moving-picture film of the "Fly Pest" was exhibited in a number of cities, a special fly bulletin was issued early in the summer, and all our forces were directed to a general campaign of sanitation. The results certainly justified the outlay of funds and energy.

THE VITAL STATISTICS CAMPAIGN.

The enactment of a modified "model" vital statistics law, following repeated agitation for such a measure, required us to inaugurate a very extensive publicity campaign. Indeed, the situation was one requiring the utmost activity on the part of the board, for the situation was in some measure critical. A very large percentage of our people were unused to the collection of vital statistics of any sort; there was sad misunderstanding as to the reasons for such law; in some quarters there was an actual hostility to the enforcement of the statute; in addition, the funds for collecting statistics were so scanty that much of the preliminary work had to be done before an assistant for vital statistics could be named.

Accordingly, a newspaper campaign was begun, in which, from week to week, the advantages of a vital statistics law were emphasized. As many illustrations as possible were drawn from experience in Virginia and a moral was pointed wherever possible. The newspapers very generously supported this campaign and speedily convinced a large part of the people that the new law was intended for their protection and could but operate to their advantage. This campaign has been continued until the present time and has been modified as the demands of the work required. The experience of an Englishman who could not enter his son in school because he had no birth certificate was citied; the plight of a Virginia negro who could not marry where he could not produce a birth certificate was discussed; the first

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recorded births and the first deaths were given wide publicity— in short, every illustrative incident in the adoption and enforcement of the statute was made the subject of a newspaper article which sounded the praises of the law. And in all this publicity the advantage to the individual from a registration of births and deaths was the central thought. All the sanitary, legal and social and demographical advantages were made secondary.

While this campaign was in progress the bureau prepared for the bureau of vital statistics a lengthy bulletin, which was, in effect, a brief in behalf of the law This was widely circulated and was received with so insistent a demand that a second edition became necessary. In addition, various literature for registrars, physicians, etc., was prepared for the bureau of vital statistics. Finally two broadsides were printed and distributed among the registrars of the State, which broadsides were aimed to reach the rural population and to enlist their support of the new law. One of these argued that where men were thoughtful enough to record the lineage of their blooded stock, they should do at least as much for their children. The other asked the question "when is your birthday" and proceeded to point out how necessary an exact record of births and deaths was to the average Virginia family Distributed throughout rural Virginia at the country stores and at the cross-roads, these broadsides have probably been read by those whom neither the press service nor the printed bulletin would influence.

SMALLPOX CAMPAIGN, ETC.

In those cases where special diseases were peculiarly prevalent in a given community we have, from time to time, distributed special literature there. When smallpox appears in a county, for example, we send first a number of large mailing cards to the postmasters to be posted in the stores. These announce the prevalence of disease and warn all persons to be vaccinated. This done, we send to every citizen of the county whose name we can procure a copy of the smallpox bulletin in which the dangers of the disease and the efficacy of vaccination are fully explained.

The same course is pursued where there is an unusual number of typhoid cases reported from a county.

CONCLUSION.

Another year of experience in Virginia has demonstrated more forcibly than ever before the benefits of popular education and the necessity of constant publicity to arouse the sentiment of the people. As the Commissioner well points out in the general report, much of the credit for the notable reduction in preventible diseases is due the people who have applied in their daily lives the great and saving truths of prevention. That more general and more specific information will accomplish still greater results is obvious; and that the State must continue, enlarge and improve its facilities for reaching the people is no less certain.

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APPENDIX FOUR.

Report of Bureau of Inspections.

R. K. FLANNAGAN, M. D.,
Director in Charge.

FUNCTIONS.

The director of this bureau is the only official of the State Board of Health whose routine duties take him systematically into every part of Virginia. Of necessity, therefore, he must act largely as the general utility field man of the department; consequently, his activities this year, owing to the increasing demands upon the department from every quarter, have been many and varied.

SCHEDULE.

The following schedule indicates in outline the scope of his work, which, with the exception of hotel inspection, has to a greater or less degree been participated in by others of the department:

Hotel Inspections.

Hotels always open.
Summer hotels.

Municipal Inspections.

Nuisances.
Water supply.
Sewage disposal.
Conferences with health officials, town officials, civic leagues, etc.

County Inspections.

Smallpox.
General sanitary conditions.

Special Typhoid Fever Inspections.

These are in co-operation with the Bureau of Rural Sanitation.

Public School Inspections.

Co-operative with State Board of Education.
Co-operative with county Y. M. C. A.

Private School and College Inspections.

Institutional Inspections.

State institutions, asylums, reformatories.
County institutions, almshouses, jails.

Railroad Inspections.

Educational Work.

Delivering addresses, lectures and talks on public health subjects.

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HOTEL INSPECTION.

Hotel inspection work has, of course, taken up the bulk of his time, but owing to the spirit of co-operation evinced by the hotel men generally in carrying out the provisions of law, there has been much less to criticize than formerly, and so in many places the inspector has been freer for other public health matters.

When the hotel in a town or village has the most sanitary arrangements and surroundings in the place, as frequently happens to be the case, justice to the proprietor demands that his neighbors be induced, if possible, to conform to his higher standards. The inspector, therefore, has endeavored to get the town authorities in such communities to likewise do their part. The hotel, then, as a sanitary lighthouse in the darkness of town and village neglect is beginning to perform a new and important function. The example set by them is already having a perceptible effect.

In order to increase their usefulness in this regard this bureau has devised a score sheet which is designed to furnish definite and uniform standards for hotel keeping. This score, a copy of which is left with the hotel man, by indicating in its text the essential points of a good hotel should enable the proprietors of even the out-of-the-way taverns to more perfectly fulfill their duty to the traveling public. The Virginia Hotel Association and the Grand Council of United Commercial Travelers have endorsed the general features of this plan.

It is hoped during the coming year to put this scheme into operation and to give credit on their certificate of approval to those hotels which score best. The test of this plan will be as to its flexibility, that the small hotels in remote districts may not be discriminated against. It is confidently expected that experience will enable the inspector to adjust any inequalities that may seem to exist in the proposed score.

During the year ending October 1, 1912, 278 hotels have been inspected; seventy-five of these are summer resort places and had therefore to be examined during the three months of the summer.

The new regulations of the State Board of Health requiring that all hotel kitchens and dining rooms be screened against flies, and that all springs and sources of water supply be properly protected, have been promulgated and in most instances are being observed. The coming year will see the full operation of these important rules.

During the year eight new hotels have been built and many old ones remodeled.

Two hotels exempt from inspection have voluntarily asked for it and paid the fee required by law. This shows the growing importance of the State Board of Health's approval in the minds of wide-awake hotel proprietors.

Attached to this report will be found a complete table of Virginia hotels and the report upon them.

MUNICIPAL INSPECTION.

Municipal inspection work has, as usual, deeply engaged the attention of this bureau. Especial emphasis is laid upon the necessity of proper sewage disposal. To this end conferences with health officers, town officials, civic

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and school leagues have been a continuing order. It is very gratifying to report that some of our cities and several of the larger towns in the State have adopted modern sanitary ordinances and are showing a tendency to pay more adequately for expert sanitary service. Alexandria, Charlottesville, Fredericksburg and Hampton are cases in point. There is still much room for improvement, since judged by modern standards the health departments of most of the cities of Virginia lack both dignity and efficiency. Notable exceptions to this are Richmond, Norfolk, Lynchburg and Roanoke, which compare favorably with any city health departments in the country.

COUNTY INSPECTIONS.

That a considerable proportion of the inspector's time is taken up in visiting smallpox epidemics continues to be a standing reproach upon the activity of county authorities. When systematic vaccination has abolished smallpox from most of the States of Europe, this loathsome disease should not longer reproach us with its periodical scares. Brunswick county authorities in their determination to stamp out this disease have put their board of health on a salary basis and confidently expect results, since now they can properly hold the board responsible for the continuance of all evil conditions making for the spread of disease. There have been eight smallpox outbreaks requiring the presence of the inspector.

SPECIAL TYPHOID FEVER INSPECTIONS.

The report of the typhoid fever investigations by this bureau will be embodied in the report of the director of rural sanitation.

PUBLIC SCHOOL INSPECTIONS.

Attention to the sanitary condition of public schools in the communities visited is a routine part of the inspector's work.

The increasing interest in the State Board of Health's work is manifest more, perhaps, in the public schools than anywhere else. Co-operation with this department by the State Board of Education is largely responsible for this gratifying fact. A sanitary survey of the schools of Shenandoah and Wise counties, in company with the Superintendent of Public Instruction, developed that interest to a marked degree.

The State Y. M. C. A. authorities are also heartily co-operating and the success of the tour of Shenandoah county, is largely due to the previous arrangements made and the active help of the efficient county Y. M. C. A. secretary.

PRIVATE SCHOOL AND INSTITUTIONAL INSPECTIONS.

The fact that the State Board of Education does not have direct jurisdiction over the private schools of the State emphasizes the need of some sanitary supervision by this department. Consequently, this bureau has, as opportunity afforded, visited many schools and colleges under private auspices. This institutional inspection work will be pursued during the coming year and advice offered as occasion demands.

Orphan asylums, reformatories, almshouses, jails and State corrective institutions have likewise this year come in for official visits by the head of this bureau.

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RAILROAD INSPECTION.

Some efforts have also been made towards having the regulations regarding railroads enforced. More active measures will be set in motion before long in regard to these matters, the neglect of which in some quarters is notorious.

EDUCATIONAL WORK.

Much of the inspector's time is taken up in educational work through addresses and stereopticon lectures. These have been given before societies and organizations of varied character, churches, public and private schools. This feature of the work will be systematized during the coming year in the interest of efficiency and economy of time and money.

Hotel List.

NAME	PLACE	Fee	Fee paid	Certificate issued	REMARKS
Afton Inn	Front Royal	$ 8 50	Yes.	Yes.	
Arlington Inn	Cape Charles	8 00	Yes.	Yes.	
Augusta	Hampton	10 00	Yes.	Yes.	
Arlington	Virginia Beach	10 00	Yes.	Yes.	
Alleghany	Covington	10 00	Yes.	Yes.	
Arlington	Norton	7 50	Yes.	Yes.	
Atlantic	Chincoteague	8 50	Yes.	Yes.	
*Alleghany Springs	Alleghany Springs	8 00	Yes.	Yes.	
*Afton House	Afton	10 00	Yes.	Yes.	
*Alleghany Inn	Goshen	10 00	Yes.	Yes.	
Augusta	Staunton	10 00	Yes.	Yes.	
Atlantic	Norfolk	10 00	Yes.	Yes.	Closed.
Algonquin	Norfolk	10 00	Yes.	Yes.	
Alhambra	Richmond	7 00	Yes.	Yes.	
Abingdon	Abingdon	9 00	Yes.	Yes.	
Accomac	Accomac	6 25	Yes.	Yes.	
Allen	Onancock	5 00	Yes.	Yes.	
Battleton Inn	Berryville	8 75	Yes.	Yes.	
Bath Tavern	Hot Springs	7 50	Yes.	Yes.	
Belmont	Basic	6 50	Yes.	Yes.	
Botetourt	Buchanan	4 50	Yes.	Yes.	
Belmont	Abingdon	10 00	Yes.	Yes.	
Boatright	Gate City	5 00	Yes.	Yes.	
Bennett	Chatham	6 75	Yes.	Yes.	
*Buckroe Beach	Buckroe Beach	10 00	Yes.	Yes.	
Brame	Floyd	5 25	Yes.	Yes.	
Burson	Bristol	6 50	No.	No.	Closed.
Blue Sulphur	St. Paul	10 00	Yes.	Yes.	
*Buffalo Lithia	Buffalo Lithia Springs	10 00	Yes.	Yes.	
*Bel Air	Newcastle	10 00	Yes.	Yes.	
*Brandon	Basic	10 00	Yes.	Yes.	
*Brunswick	Waynesboro	7 00	Yes.	Yes.	
*Bon Air Inn	Bon Air	7 50	Yes.	Yes.	
*Blue Ridge Springs	Blue Ridge Springs	10 00	Yes.	Yes.	
Burton	Danville	10 00	Yes.	Yes.	
Bristol	Bristol	10 00	Yes.	Yes.	New.
Boyd	Wytheville	5 50	Yes.	Yes.	Reopened.
*Bay Shore	Buckroe Beach	5 50	Yes.	Yes.	Colored resort.
Broad Street	Martinsville	5 00	Yes.	Yes.	New.
*Buffalo Ridge	Agee	7 00	Yes.	Yes.	
*Breakers	Colonial Beach	4 00	No.	No.	
*Byrd	Colonial Beach	5 00	Yes.	Yes.	
Blue Sulphur	Cedar Bluff				
*Blue Healing Springs	Vista				Not inspected. Open 1913.
Colonial Inn	Williamsburg	6 00	Yes.	Yes.	
Central	Lexington	5 50	Yes.	Yes.	
Central	Buchanan	5 00	Yes.	Yes.	

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HOTEL LIST—CONTINUED.

NAME	PLACE	Fee	Fee paid	Certificate issued	REMARKS
Commonwealth	Altavista	$ 9 00	Yes.	Yes.	
Christiansburg	Christiansburg	5 00	Yes.		
*Colonial Beach	Colonial Beach	10 00	No.		
*Craig Healing	Vista	10 00	Yes.	Yes.	
Central	Galax	4 00	Yes.	Yes.	
*Crockett Springs	Crockett Springs	10 00	Yes.	Yes.	
Chalybeate Springs	Strasburg	5 00	Yes.	Yes.	
Chatham	Chatham	4 50	Yes.	Yes.	
Central	Marion	4 50	Yes.	Yes.	
Clinchview	Lebanon	4 50	Yes.	No.	
Clifton	Norfolk	10 00	No.	No.	
Central	Newcastle	4 50	No.	No.	
*Castle Hill	Lexington	8 00	Yes.	Yes.	
Colonial	Charlottesville	10 00	Yes.	Yes.	
Clermont	Charlottesville	9 50	Yes.	Yes.	
Carter House	Charlottesville	6 25	Yes.	Yes.	
Coleman	Orange	8 00	Yes.	Yes.	
Colonial	Norfolk	10 00	Yes.	Yes.	
Comfort	Norfolk	10 00	Yes.	Yes.	
Colonial	Danville	7 50	Yes.	Yes.	
Commercial	Richmond	5 00	Yes.	Yes.	
Chesterfield	Petersburg	9 50	Yes.	Yes.	
Carroll	Lynchburg	10 00	Yes.	Yes.	
Commercial	Lynchburg	4 50	Yes.	Yes.	
Charlotte	Keysville	5 75	Yes.	Yes.	
Colonial	South Boston	4 00	Yes.	Yes.	
Clinchfield Inn	Dante	7 50	Yes.	Yes.	(Dante Hotel.)
Colonial	Wise	7 50	Yes.	Yes.	(Wise Hotel.)
Collins	Covington	10 00	Yes.	Yes.	New.
Cambria	Cambria	4 50	Yes.	Yes.	New.
Crow House	Glade Spring	5 50	Yes.	Yes.	(Thompson House)
*Cason Cottage	Ocean View	6 00	Yes.	Yes.	
Commercial	Newport News	7 00	Yes.	Yes.	
Claiborne	Lawrenceville	7 00	Yes.	Yes.	
Central	Lawrenceville	4 50	Yes.	Yes.	
*Cool Heights	Buena Vista	10 00	No.	No.	Closed before season was over.
*Caldwell Springs	New Castle	5 00	Yes.	No.	
Central	Pearisburg	5 50	Yes.	No.	
*Crown Castle	Colonial Beach	5 00	No.	No.	
Chambliss House	Emporia	4 00	Yes	Yes.	Reopened.
Central	Independence	5 00	Yes.	No.	
Dickinson	Richmond	6 00	Yes.	Yes.	
Davis	Richmond	10 00	Yes.	Yes.	
Delmont	Newport News	3 00	Yes.	No.	
*Dance Cottage	Virginia Beach	5 00	Yes.	Yes.	
Eagle	Shenandoah	5 50	Yes.	Yes.	
Edinburg	Edinburg	4 50	Yes.	Yes.	
Evans	Winchester	10 00	Yes.	Yes.	
Exchange	Newport News	6 00	Yes.	Yes.	
East End	East Radford	4 25	Yes.	Yes.	
Eubank	Kilmarnock	5 75	Yes.	Yes.	
*Elkton	Elkton	10 00	Yes.	Yes.	
*Edge Hill	Montvale	5 00	Yes.	Yes.	
Eureka	Roanoke	4 00	Yes.	Yes.	
Exchange	Boydton	5 50	Yes.	Yes.	
*Emviga	Colonial Beach	6 00	Yes.	Yes.	
Fourth Avenue	Wytheville	10 00	Yes.	Yes.	
*Ferebee	Virginia Beach	10 00	Yes.	Yes.	
Fuller's	Phoebus	6 00	Yes.	Yes.	
Franklin City	Franklin City	3 50	Yes.	Yes.	
Fairfax	Winchester	6 00	Yes.	Yes.	
Fairfax	Norfolk	10 00	Yes.	Yes.	
Francione's	Richmond	5 25	Yes.	Yes.	
Frederick	Fredericksburg	9 00	Yes.	Yes.	(Exchange.)
Gilberts	Richmond	10 00	Yes.	Yes.	
Gladys Inn	Clifton Forge	10 00	Yes.	Yes.	
Granby Inn	Norfolk	9 50	No.	No.	
Grace	Clarksville	5 00	Yes.	Yes.	

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HOTEL LIST—CONTINUED.

NAME	PLACE	Fee	Fee paid	Certificate issued	REMARKS
Garland	South Boston	$10 00	Yes.	Yes.	
Glamorgan	Glamorgan	5 00	Yes.	Yes.	
Graham	Graham	5 25	Yes.	Yes.	
Guerrant	Richmond	10 00	Yes.	Yes.	Changed mg'mt
*Georgia Cottage	Virginia Beach	4 00	Yes.	Yes.	
Greystone Inn	Fordwick				Not inspected.
Henry Clay Inn	Ashland	10 00	Yes.	Yes.	Changed management.
Holtzman	Woodstock	6 00	Yes.	Yes.	
Homestead	Hot Springs	10 00	Yes.	Yes.	
Hamilton	Martinsville	6 50	Yes.	Yes.	
*Hygiea	Cape Henry	5 50	Yes.	Yes.	
Hamilton	Bristol	10 00	Yes.	Yes.	
Halifax Inn	Houston	5 00	Yes.	Yes.	
The Hague	Norfolk	6 00	Yes.	Yes.	
Hayths	Fincastle	5 00	Yes.	Yes.	
*Healing Springs	Healing Springs	10 00	Yes.	Yes.	
Heights	Harrisonburg	4 50	Yes.	Yes.	
Hartsook	Coeburg	4 50	Yes.	Yes.	
Hudson	Colonial Beach	4 00	Yes.	Yes.	
Hallwood	Hallwood	4 75	Yes.	Yes.	(Broughton.)
*Irvington Beach	Irvington	8 50	Yes.	Yes.	
Jefferson	Richmond	10 00	Yes.	Yes.	
*Jordan Springs	Winchester	10 00	No.	No.	
*Jefferson Park	Charlottesville	10 00	Yes.	Yes.	
Jeffersonville	Tazewell	6 50	Yes.	Yes.	
Jamestown	Smithfield	5 25	Yes.	Yes.	
Kavanaugh	Harrisonburg	10 00	Yes.	Yes.	
Keysville	Keysville	3 50	Yes.	Yes.	
Keokee	Keokee	5 00	Yes.	Yes.	(Park Hotel.) Reopened.
Kari	Roanoke	10 00	Yes.	Yes.	
*King George	Colonial Beach	5 50	No.	No.	
Laurence	Luray	7 50	Yes.	Yes.	
Little Mecklenburg	Chase City	6 50	Yes.	Yes.	
Louisa	Louisa	6 50	Yes.	Yes.	
Lexington	Lexington	10 00	Yes.	Yes.	
Lawn	Bowling Green	5 50	Yes.	Yes.	
Lewellyn	Radford	10 00			Reopens 1913.
*Linwood	Colonial Beach	10 0	Yes.	Yes.	
*Loudoun	Bluemont	10 0	Yes.	Yes.	
Lorraine	Norfolk	10 00	Yes.	Yes.	
Lynnhaven	Norfolk	10 00	Yes.	Yes.	
Lexington	Newport News	7 50	Yes.	Yes.	
Lexington	Richmond	10 00	Yes.	Yes.	
Lawrence	Richmond	8 00	Yes.	Yes.	
*Lowe Cottage	Ocean View	6 50	Yes.	Yes.	
Leesburg Inn	Leesburg	10 00	Yes.	Yes.	
Mansion Inn	Luray	10 00	Yes.	Yes.	
Maple Shade Inn	Pulaski	10 00	Yes.	Yes.	
Marlbrooke	Buena Vista	6 00	Yes.	Yes.	
Monte Vista	Big Stone Gap	10 00	Yes.	Yes.	
Mount Vernon	Norfolk	6 00	No.	No.	
Morgan	Danville	10 00	Yes.	Yes.	
Mountain House	Floyd	4 50	Yes.	No.	
*Mountain Lake	Mountain Lake	10 00	Yes.	Yes.	
*Massanetta Springs	Harrisonburg	10 00	Yes.	Yes.	
*Millboro	Millboro	10 00	Yes.	Yes.	
*Mount Elliott Springs	Mount Elliott	10 00	Yes.	Yes.	
*Midway Inn	Hot Springs	8 75	Yes.	Yes.	
*Millboro Springs	Millboro	10 00	Yes.	Yes.	
Monticello	Norfolk	10 00	Yes.	Yes.	
Monroe	Portsmouth	10 00	Yes.	Yes.	
Murphys	Richmond	10 00	Yes.	Yes.	
Monticello	Lynchburg	6 00	Yes.	Yes.	
Miller's	Richmond	8 50	Yes.	Yes.	Colored.
*Monte Vista Springs	Vista	8 00	Yes.	Yes.	
McClintic	Hot Springs	6 50	Yes.	Yes.	

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HOTEL LIST—CONTINUED.

NAME	PLACE	Fee	Fee paid	Certificate issued	REMARKS
New Rammel	Alexandria	$ 8 00	Yes.	Yes.	
New Gladstone	Norfolk	10 00	Yes.	Yes.	
Neddo	Norfolk	10 00	Yes.	Yes.	
Newport	Newport News	10 00	Yes.	Yes.	
Nansemond	Suffolk	10 00	Yes.	Yes.	
New Central	Roanoke	6 50	Yes.	Yes.	
New Hotel Gleason	Charlottesville	10 00	Yes.	Yes.	
National	Harrisonburg	10 00	Yes.	Yes.	Chg. management.
New Commercial	Woodstock	9 00	Yes.	------	Merged, Holtzman.
New St. Charles	Norton	7 00	Yes.	Yes.	Chg. management.
Narrows	Narrows	4 50	Yes.	Yes.	
New Prince William	Manassas	7 00	Yes.		
New Shirley	Petersburg	10 00	Yes.	Yes.	
Neese	Waynesboro	7 00	Yes.	Yes.	
*Natural Bridge	Natural Bridge	10 00	Yes.	Yes.	
*Nimrod Hall	Nimrod Hall	9 00	Yes.	Yes.	
O'Connor	West Point	4 75	Yes.	Yes.	
Oliver	Crewe	7 00	Yes.	No.	
*Ocean View	Ocean View	10 00	Yes.	Yes.	
*Orkney Springs	Orkney Springs	10 00	Yes.	Yes.	
*Otterburn Springs	Amelia	10 00	Yes.	Yes.	
Ponce de Leon	Roanoke	10 00	Yes.	Yes.	
Princess	Norfolk	10 00	Yes.	Yes.	
Pocahontas	Newport News	10 00	Yes.	Yes.	
Prince Edward	Farmville	8 00	Yes.	Yes.	Chg. management.
Persons	Boykins	5 00	Yes.	No.	
*Princess Anne Cottage	Virginia Beach	5 75	Yes.	Yes.	
*Patrick Springs	Patrick Springs	9 50	Yes.	Yes.	
*Pulaski Alum Springs	Pulaski	10 00	Yes.	Yes.	
Palace	Bedford City	6 75	Yes.		
Pulaski	Pulaski	10 00	Yes.	Yes.	
Parksley	Parksley	4 75	Yes.	Yes.	
Pocahontas Inn	Pocahontas	10 00	Yes.	Yes.	
Pennington	Pennington Gap	9 50	Yes.	No.	Chg. management.
Ripberger	Blackstone	6 50	Yes.	Yes.	
*Rocky Mount	Rocky Mount	No.	Yes.	------	Burned. Reopens 1913.
Ross House	Urbanna	5 00	Yes.	Yes.	
*Rawley Springs	Rawley Springs	10 00	Yes.	Yes.	
*Rockbridge Inn	Goshen	5 00	Yes.	Yes.	
*Rockbridge Baths	Rockbridge Baths	10 00	Yes.	Yes.	
*Rockbridge Alum	Rockbridge Alum Spgs.	10 00	Yes.	Yes.	
Rueger	Richmond	------	------	------	Reopens 1913.
Roanoke	Roanoke	10 00	Yes.	Yes.	
Roby	Lynchburg	10 00	Yes.	Yes.	
Randolph	Roanoke	6 50	Yes.	Yes.	
Richlands	Richlands	3 50	Yes.	Yes.	Voluntary inspection.
*Rustic Cottage	Ocean View	5 00	Yes.	Yes.	
Richmond	Richmond	10 00	Yes.	Yes.	
St. John	Gordonsville	6 50	Yes.	Yes.	
Stratford	Roanoke	10 00	Yes.	Yes.	
Stag	Norfolk	4 75	Yes.	Yes.	
Stumpf's	Richmond	10 00	Yes.	Yes.	
Stratford	Petersburg	10 00	Yes.	Yes.	
Shenandoah	Roanoke	10 00	Yes.	Yes.	
Southern	Roanoke	5 00	Yes.	No.	
St. James	Roanoke	10 00	Yes.	Yes.	
St. Rickler	Front Royal	6 25	Yes.	Yes.	
Stonewall Inn	Franklin	7 25	Yes.	Yes.	
Stonega House	Stonega	5 50	Yes.	Yes.	
St. James	Appalachia	6 00	Yes.	Yes.	Chg. management.
*Stribling Springs	Mt. Solon	6 00	Yes.	Yes.	
*Skyland	Skyland	10 00	Yes.	Yes.	
Shenandoah	Winchester	3 00	Yes.	Yes.	Voluntary inspection.
Salem	Salem	6 75	Yes.	Yes.	
Saltville	Saltville	5 00	Yes.	Yes.	
Sprinkle	Rural Retreat	4 00	Yes.	Yes.	

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HOTEL LIST—CONTINUED.

NAME	PLACE	Fee	Fee paid	Certificate issued	REMARKS
St. Lawrence	Bristol	$10 00	Yes.	No.	Undergoing repairs.
*Sea Breeze	Cape Henry	4 00	Yes.	Yes.	
Savoy	Pearisburg	5 00	Yes.	Yes.	
St. Charles	Mt. Jackson	10 00	Yes.	No.	
*Sweet Chalybeate	Sweet Chalybeate	10 00	Yes.	Yes.	
Tutwiler	Blacksburg	4 75	Yes.	Yes.	
Twin City	Bristol	4 50	Yes.	Yes.	
Texas House	Hillsville	------	------	------	Only 10 rooms used.
Tip Top	Bristol	10 00	Yes.	Yes.	Closed.
*Tip Top Mineral Springs	Tip Top	10 00	Yes.	Yes.	
Tavern	Fairfax	5 00	Yes.	Yes.	New.
Union	Norfolk	10 00	Yes.	Yes.	Prosecuted. Convicted.
Virginia	Staunton	10 00	Yes.	Yes.	
Victoria	Norfolk	10 00	Yes.	Yes.	
Virginia	Emporia	10 00	Yes.	Yes.	
Virginian	Franklin	7 00	Yes.	Yes.	
*Virginia Mineral Springs	New Castle	------	------	------	Open 1913.
Virginia	Elkton	5 00	Yes.	Yes.	
Valley House	Marion	7 00	Yes.	Yes.	
Virginia	Cape Charles	7 00	Yes.	Yes.	
Virgilina	Virgilina	4 00	Yes.	Yes.	
*Virginia Bay	Ocean View	10 00	Yes.	Yes.	
*Virginia Beach	Virginia Beach	10 00	Yes.		
Valley Hotel	Winchester	4 00	Yes.	Yes.	
*Winchester Inn	Winchester	10 00	Yes.	Yes.	
Wayside Inn	Middletown	6 00	Yes.	Yes.	
West End	Radford	7 50	Yes.	Yes.	
Willson	Burkeville	6 00	Yes.	Yes.	
*Wachapreague	Wachapreague	10 00	Yes.	Yes.	
*Waverly	Virginia Beach	6 50	Yes.	Yes.	Chg. management.
Waugh	Galax	4 50	Yes.	Yes.	
Windsor	Appalachia	5 00	Yes.	Yes.	
Walcott	Colonial Beach	9 50	Yes.	Yes.	
*Willoughby Beach	Willoughby Beach	10 00	Yes.	Yes.	
*Waterlick White Sulphur	Waterlick	10 00	Yes.	Yes.	
*Wilson Springs	Rockbridge Baths	4 00	Yes.		
*Warm Springs	Warm Springs	10 00	Yes.		
Warren Green	Warrenton	10 00	Yes.	Yes.	
Waverly	Culpeper	8 00	Yes.	Yes.	
Warwick	Newport News	10 00	Yes.	Yes.	
Westover	Farmville	4 75	Yes.		Chg. management.
*Williams	Colonial Beach	6 00	Yes.	Yes.	New.
*Willoughby Club	Willoughby Beach	6 00	No.	No.	
*Washington Springs	Glade Spring	10 00	No.	No.	
Washington	Fries	5 00	Yes.	Yes.	

*Summer hotels.

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APPENDIX FIVE.

Report of the Bureau of Sanitary Engineering.

RICHARD MESSER, C. E.,
Director in Charge.

GENERAL STATEMENT.

The work of this bureau during the past year has proceeded along the same general lines as in the year preceding. A systematic investigation of all the public water supplies and sewerage systems of the various cities and towns of the Commonwealth has been carried forward as rapidly as possible and has been almost completed, while an effort has been made to arouse public interest in the general betterment of sanitary conditions. Whenever possible the co-operation of members of the town councils and of leading citizens has been enlisted for a more active interest in local sanitation.

PUBLIC WATER SUPPLIES.

That the purity of the public water supply bears a most intimate relation to the health of a community is truism known to all sanitarians, yet its vital importance to the people of Virginia cannot be too vigorously impressed. As shown in the report of this bureau for 1911 and in the list appended to this report, practically every public water supply in the State has come under the inspection of this bureau during our two years' work. Preliminary and general information was secured from blanks forwarded to local authorities and filled out by them, but data much more complete has been had, in many instances, through personal inspection. In some cases localities have requested a detailed examination in forwarding the information requested, but generally we have been forced to take the initiative.

Whenever during an investigation evidence of pollution was observed that fact was brought at once to the attention of the local council and of other officers and detailed report on conditions was later forwarded. In some localities where it was observed that no official action would be taken to better conditions a campaign was inaugurated to enlist the co-operation of the people of the community.

PROPOSED PUBLIC WATER SUPPLIES.

During the past year a number of towns have established new systems of public water supply. In most towns where this was done a request was received by this bureau, in advance of work, to investigate local needs and to advise as to the best sources of supply and the best general type of system. In all such cases the engineer has given such assistance as lay in his power. It is not, however, the purpose of the bureau to do more than to act as general adviser. The surveys, plans and specifications must, in the nature of the case, be prepared by some consulting engineer.

There is now no law which requires that plans for water works and sewerage systems must be approved by the board of health, but we have en-

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couraged the towns and cities to forward their plans for inspection before a contract was let. During the last year a number of towns have done this or else have requested a personal inspection. This phase of our work may be expected to increase with time.

PORTABLE HYPOCHLORITE WATER DISINFECTING PLANT.

During the past year a portable hypochlorite plant has been constructed by the board similar to the one designed for the Minnesota Board of Health. This plant is kept in readiness for emergency use in the event of the unforeseen pollution of a municipal water supply. The essential features of this simple device are a mixing barrel, two storage barrels, regulating apparatus and the necessary connections. The outfit can be shipped at a moment's notice. During the past summer this plant was used at Leesburg, where the water supply was suspected as the cause of about a dozen cases of typhoid. A similar plant was set up and operated at Petersburg during the period when water for that city was being drawn from an emergency intake on the Appomattox river.

SEWERAGE AND SEWAGE DISPOSAL.

The work of this bureau in regard to sewerage and sewage disposal has been carried on along with the investigation of the public water supplies. The blanks referred to above contain a series of questions as the nature of the sewerage system in a given town, the number of miles of sewers and the location and number of outlets. An inspection has been made of nearly all the systems in the State, with especial reference to the location of the outlets and the nature and size of the streams receiving the sewage.

Practically all the sewage from the systems in operation in the State is discharged directly, without any treatment, into streams and tidal waters. Of the fifty-nine towns listed, only two have any provision for sewage treatment and these two include a very small percentage of the State's population. In the majority of cases, however, disposal by dilution constitutes a safe and proper method of caring for the sewage. Almost every inland city or large town is situated near some river or other stream which has sufficient volume of flow to receive the sewage under present conditions without constituting any nuisance or menace to the public health. Very few of the municipalities are forced to depend upon a stream which receives any considerable amount of sewage pollution above the point of intake. In the few instances which do exist some standard method of water purification has been or should be adopted.

The cities located near tidewater continue to dispose of their sewage by dilution. The time is rapidly approaching, however, when some of these municipalities will be required to treat their sewage in such a manner as to prevent the necessity of abandoning the cultivation of very valuable oyster grounds in the vicinity of the present outlets. The department has already begun an investigation of the conditions. As shown in another report contained herein the department has advised the disinfection of sewage from municipalities situated in the vicinity of Hampton flats. There are a few cases which have come to the attention of the bureau where some method of sewage treatment should be adopted to safeguard the rights of riparian owners, especially where the stream in question traverses pastures used

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by dairy stock. The department is always ready to make a full investigation wherever the rights of riparian owners are involved and suggest methods by which sewage may be treated to prevent nuisances or menace to the public health. In any event the laws protecting the rights of riparian owners are very strict and well defined, and if other measures fail legal procedure will usually bring about a satisfactory adjustment.

PROPOSED SEWERAGE SYSTEMS.

A number of requests have been received concerning the installation of new systems and the most practical and sanitary manner of disposing of the effluent. In each case the engineer has visited the municipality for the purpose of investigating the conditions and conferring with the local authorities. Usually a report containing the important facts learned by the investigation and recommendations is drawn up on return to the office and then forwarded to the mayor. In this way complete records are kept pertaining to the policy and requirements of the department in individual cases.

As in the case of plans for public water supplies, the department advises all municipal authorities to forward any plans for sewage or extensions to present systems to this office for approval. Plans for a number of systems have been passed on during the year and it is hoped that more will come in during the coming year.

PRIVATE SEWAGE DISPOSAL PLANTS.

During the past year a great many communications have been received concerning the best type of plant to be used in connection with private residences. The department has on hand a bulletin containing instructions and general plans for several types of systems which have given fair satisfaction where properly constructed and looked after. In most cases a copy of this bulletin has been sent to inquirers and correspondence asked concerning any points on which the reader is doubtful. Also further detailed information concerning the local conditions and needs requested.

It has been necessary in some instances to visit the locality and later prepare sketches to meet special conditions. As shown in Table III B., the engineer has prepared during the year sketches and plans more or less complete as the conditions required for twelve individual plants. Most of these have already been built and as far as known are giving satisfaction.

GENERAL SANITATION IN TOWNS.

Studies of the sanitary conditions of certain of the smaller towns have formed an important part of the work of this bureau. Thirty-six such investigations have been made during the year and recommendations made as to public improvements. The results so far obtained have been so gratifying that as much attention as possible will be given to this work in the future.

In a given town information is collected relative to what health ordinances, if any have been passed by the council, and to what degree they are enforced, the cleanliness of the streets and alleys, public and private wells, cesspools and drainage into ditches and especially the use of insanitary privies. The next step is to enlist the co-operation of the mayor and as many members

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of the council as possible, explaining the nature of the investigation and the need of certain improvements. After such preliminary work a meeting of the council is sometimes called and the whole matter discussed. Health ordinances properly carried out by an active inspector will do much towards improved sanitation. The department has prepared a complete code of health ordinances for use in towns. These are based on actual experience and the facts learned by investigations. The council is urged to study this code, make any changes to fit local conditions and then adopt it. Sometimes several visits are necessary to a town before the recommendations are acted upon. Each visit, however, shows a more lively interest in sanitation on the part of the citizens and sooner or later public sentiment will bring about many necessary improvements.

STATE INSTITUTIONS.

Applications for advice and inspections have been received from a number of public and private institutions. The work has included inspections of existing systems of water supply and sewerage and investigations relating to proposed systems or extensions. As shown in the summary, a number of plans have been approved by the engineer.

During the coming year inspection will be made of each of the institutions depending on State appropriation and as many of the others as possible.

MISCELLANEOUS INSPECTIONS.

This includes inspections relating to private water supplies, existing and proposed, public nuisances and swamp drainage.

In the future swamp drainage as relating to malarial infection will form an important part of the work of the department. The investigation mentioned elsewhere made at Keeling brought to light frightful malarial conditions which could be remedied at a reasonable expenditure of money and by effective co-operation among the people in the vicinity.

The following tables include a short summary of the work done during the year:

TABLE I.

General Summary of Work During the Year Ending October 1, 1912.

Towns and Cities.	No.
1. Water supply inspections, general	38
2. Water supply inspections, special	4
3. Proposed water supply investigations	5
4. Emergency hypochlorite plants installed	2
5. Water supply plans approved	4
6. Sewerage system inspections	31
7. Proposed sewerage system investigations	7
8. Sewerage system plans approved	4
9. General sanitation, investigations	36
10. Stream pollution investigations	8

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State Institutions.

1. Water supply inspections..... 5
2. Proposed water supply investigations..... 4
3. Water supply plans approved..... 1
4. Sewerage system inspections..... 6
5. Sewerage system plans approved..... 2
6. Sewerage disposal plans prepared..... 4

Individuals.

1. Private sewage disposal plans approved..... 2
2. Private sewage disposal plans prepared..... 12

Miscellaneous.

1. Private water supplies inspections..... 6
2. Swamp drainage investigations..... 2

Official reports issued..... 18

TABLE II.

Statement Showing the Cities and Towns Visited During the Year, with a Brief Summary of Each Investigation or Inspection.

CITY OR TOWN	DATES	PURPOSE OF VISIT
Altavista	April 1	Inspection of public water supply, especially the springs and reservoirs. Sewerage—Inspection of outlets. General sanitation.
Appalachia	August 16	General sanitation.
Bedford	April 3	Inspection of public water supply and sewer outlets. General sanitation. Inspection of county jail.
Big Stone Gap	August 16	Public water supply, sanitary survey of watershed. Inspection of sewer outlets.
Blackstone	August 23	Inspection of stream below sewer outlet relative to nuisances to riparian owners.
Boydton	August 2	General sanitation.
Boykin	March 20	General sanitation.
Bridgewater	July 3, 4 (by request)	Inspection of available sources of proposed public water supply. Method of sewage, disposal from proposed system. General sanitation.
Bristol	August 17	Public water supply, inspection of springs used.
Brookneal	August 22	General sanitation.
Burkeville	August 23	General sanitation.
Cedar Bluff	August 15	General sanitation.
Chase City	June 14, 15 (by request)	Approval of plans for public water supply and sewage system and proposed methods of sewage disposal.
Chatham	August 21 (by request)	Method of disposing of sewage from system under construction. Public water supply, inspection of springs used.
Clover	June 13	General sanitation.
Coeburn	August 16	General sanitation.
Courtland	March 21 (by request)	Nuisance by sewage discharged into surface drainage ditch. General sanitation.
Covington	Sept. 8, 9 (by request)	Inspection of emergency water works intake, located on Jackson river. Inspection of sewer outlets.
Culpeper	June 20-22 (by request)	Public water supply, sanitary survey of water shed, approval of plants for filtration plant. Sewerage, disposal of sewage from northeast section of town. Inspection of stream five miles below present sewage irrigation fields. Official report issued July 16.

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TABLE II—CONTINUED.

CITY OR TOWN	DATES	PURPOSE OF VISIT
Danville	June 24	Public water supply. Inspection of purification plant and reservoir. Sewerage, inspection of outlets.
Drakes Branch	June 12	General sanitation.
Edinburg	November 15	Public water supply. Sanitary survey of water shed. General sanitation, especially relative to public wells.
Elkton	July 5	Public water supply, inspection of springs. Sewage, inspection of outlet. General sanitation.
Fairfax	June 27, Sept. 25 (by request)	General sanitation.
Farmville	April 4-6	Public water supply, sanitary survey of water shed, inspection of filtration plant and proposed change of intake. Inspection of public wells. Official report issued April 8.
Fredericksburg	July 29, 30	Public water supply, inspection of settling basin and reservoir. Inspection of private water system supplying portion of town.
Franklin	March 21	Public water supply, inspection. Sewerage, inspection of outlets.
Gate City	August 17	Public water supply, inspection of source.
Gayton	April 26 (by request)	Proposed public water supply and general sanitation.
Graham	August 13, 14 (by request)	Inspection of stream polluted by sewage from Bluefield. General sanitation.
Hampden Sidney	April 5	Disposal of sewage with reference to stream pollution.
Hampton	April 17, May 2, 3	Sewage, data concerning volume of sewage and arrangement of system relative to the sterilization process.
Harrisonburg	Feb. 6-8 (by request)	Sewage treatment. Advice concerning plans for treatment of sewage and tannery wastes. Investigation as to feasibility of constructing trunk sewer to North river and disposal of sewage by dilution. Public water supply, inspection of water shed. Official report issued May 9.
Honaker	August 16	General sanitation.
Houston	August 22	Private water supplies and sewage.
Kenbridge	August 1 (by request)	General sanitation, especially relative to private sewage disposal plants.
Keysville	June 13	General sanitation.
Lacrosse	August 3	General sanitation.
Lawrenceville	Sept. 3 (by request)	Sewage disposal with reference to stream pollution and objection by riparian owners. (System under construction.) Official report issued.
Leesburg	June 25, 26	Public water supply, inspection of spring and deep well. Available sources for proposed gravity supply. Disposal of sewage. Official report issued July 15.
	Aug. 25-28 (by request)	Emergency hypochlorate plant installed.
Lexington	Sept. 7 (by request)	Stream pollution by sewage.
Lynchburg	Sept. 6 (by request)	Public water supply, algae growths, and method of treatment.
Manassas	June 24	General sanitation.
Martinsville	June 25	Public water supply, sanitary survey of water shed, inspection of filtration plant. Sewerage, inspection of sewer outlets.
Meherrin	August 1	General sanitation.
Mount Jackson	November 14	Public water supply, inspection of springs. Sewerage, inspection of outlet. General sanitation. Official report issued November 27.
Newport News	February 1	Public water supply, inspection of filtration plant.
	April 30, May 1	Sewerage, inspection of sewer outlets, data in regard to volumes of flow.
Norfolk	June 31, Feb. 1, 2	Public water supply, inspection of filtration plant.
North Tazewell	August 15	Public water supply, inspection of spring.

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TABLE II—CONTINUED.

CITY OR TOWN	DATES	PURPOSE OF VISIT
Norton	August 16	Public water supply, inspection of springs. Sewerage, inspection of outlet.
New Market	November 13	Proposed public water supply, available sources. General sanitation. Official report issued November 27.
Ocean View	May 3 (by request)	General sanitation.
Old Point	April 20	Sewerage, inspection of tanks, pumping station and outlet.
Pembroke	August 12	General sanitation.
Petersburg	July 23-25, Aug. 8, 9	Public water supply, sanitary survey of water shed. Inspection of filtration plant. Advise hypochlorate plant to treat water from emergency intake. Official report July 25. Sewerage, inspection of plans and outlets.
Phoebus	May 2	Sewerage, inspection of outlets, data in regard to volume of flow.
Portsmouth	January 30	Sewerage, data in regard to system and outlets.
Pulaski	Oct. 16, 17 (by request)	Disposal of sewage into Peak creek from proposed system.
Richlands	August 15	Public water supply, sanitary survey of water shed for four miles above intake. General sanitation.
Rocky Mount	January 26	Public water supply and sewerage relative to proposed systems.
Salem	September 18	Public water supply, inspection of springs and well.
Shenandoah	July 5, 6	Public water supply, inspection of pumping station and intake. Official report issued July 24.
South Boston	January 23	Public water supply, inspection of pumping station and intake. Sewerage, inspection of outlets. General sanitation, especially relative to the use of private wells. Official report issued February 21.
South Hill	August 2	Public water supply, inspection of well.
Strasburg	November 17	Public water supply, inspection of spring. General sanitation. Official report issued November 27.
Suffolk	March 21, 22 (by request)	Inspection of filtration plant and collection of samples for analyses.
Tazewell	August 15	Public water supply, inspection of springs.
Victoria	July 31	General sanitation.
West Point	August 6, 7	Public water supply, inspection of wells and pumping station. Sewerage, inspection of outlets.
Winchester	November 18	Public water supply, inspection of springs and pumping station. Sewerage, inspection of sewage treating plant.
Woodstock	November 16	Public water supply, inspection of springs. General sanitation. Official report issued November 27.

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TABLE III.

Miscellaneous Inspections and Consultations During the Year, with the Purpose Thereof.

A. Public and Private Institutions.

Baptist Orphanage, Salem.—Sanitary survey of watershed of proposed water supply. Approval of plans.

Central State Hospital, Petersburg.—Approval of plans and specifications for proposed sewer line to river, comprising screen chamber, automatic flush tank, inverted siphon and canal crossing.

Tuberculosis Camp, Petersburg.—Plans for sewage disposal plant.

Catawba Sanatorium.—Complete investigation, plans and report as to future extensions of water supply—enumeration of available sources. Complete investigation, plans and report as to future extensions of sewerage system and filter. Investigation as to possible water-power development for the sanctorium at Cooper's Mill.

Faixfax County Almshouse.—Plans for sewage disposal plant.

Hampton Normal and Agricultural Institute.—Inspection of sewer system. With Dr. Ferguson set up and operated sewage disinfecting plant to best efficiency of process. (See detailed report.)

National Soldiers' Home, Hampton.—Inspection of automatic sewage pumping stations and outlets. Data concerning daily volume of flow.

Pine Camp, near Richmond.—Inspection of sewage disposal plant. Inspection of stream below outlet, relative to pollution.

State Epileptic Hospital, near Lynchburg.—Sanitary survey of watershed for proposed water supply. Advice concerning pipe line from Lynchburg comprising river crossing.

State Normal School, Fredericksburg.—Inspection of water supply.

Virginia Military Institute, Lexington.—Location of proposed sewer outlet.

Virginia Normal and Industrial Institute, Petersburg.—Inspection of water supply. Samples for analysis collected from new drilled well.

Westhampton School.—Plans for sewage disposal plant.

Home and Industrial School for Girls, Bon Air.—Available sources for proposed water supply.

B. Private Homes.

Brookdale—E. G. Schmidt.—Plans for Imhoff tank for suburban development, capacity 500 persons. Tank constructed under general supervision of department.

Catawba—Dr. John J. Loyd.—Sewage disposal plant for residence.

Courtland—W. J. Sebrell.—Plans for sewage disposal plant for residence.

Fairfax—R. P. Henry.—Plans for sewage disposal plant for hotel, "The Tavern."

T. R. Keith.—Inspection of private sewage disposal plant, relative to extension and improvements.

Forest Hill—Mrs. B. A. Hancock.—Plan for sewage disposal for residence.

Kenbridge—I. T. Wilkinson and D. T. Kennedy.—Plans for sewage disposal for residence.

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TABLE III—CONTINUED.

L. A. Hardy.—Disposal of sewage from hotel.

Mine Run—I. K.Rowe.—Plans for sewage disposal plant for residence.

North Emporia—Dr. Lucien Loften.—Approval of plan for private sewage disposal plant.

Richmond—Dr. Stuart McGuire.—Advice concerning sewage disposal from residence in Chesterfield county.

L. C. Williams.—Plans for sewage disposal plant for residence.

Kastin.—Plans for private plant.

C. Miscellaneous.

Catawba—J. B. Andrews.—Advice concerning the source and installation of private water supply for Cooper residence.

Forest Hill—Mrs. B. A. Hancock.—Inspection of three private wells relative to source of pollution indicated by analysis.

Keeling (Oct. 31-Nov. 4).—Investigation of swamp drainage relative to breeding mosquitoes and malarial infection. About two hundred people in the vicinity affected. Advice as to method of procedure.

Mountain Lake—Hotel.—Sanitary inspection of water supply, method of disposing of water, etc.

Westhampton—Dr. G. W. McDaniel.—Inspection of private well.

T. W. Purcell—Land drainage—inspection of lowlands in vicinity of residence relative to breeding mosquitoes.

TABLE IV.

Water Supply and Sewerage Statistics.

A. Towns Installing Water Supplies During Year Ending September 30, 1912

Bridgewater,
Chase City,
Colonial Beach,
Dublin,
Lawrenceville,
Rocky Mount,
South Hill.

B. Towns Installing Sewerage Systems During Year Ending September 30, 1912.

Abingdon,
Bridgewater,
Chase City,
Chatham,
Dublin,
Colonial Beach,
Lawrenceville,
Pulaski,
Rocky Mount.

C. Classification of Towns and Cities With and Without Water Supplies, September 30, 1912.

This table is of interest in that it shows every town in Virginia with more than 1,500 population, except one (Williamsburg), provided with a public water supply:

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[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]	Number	Total Population
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

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TABLE IV—CONTINUED.

D.—General Statistics as to Existing Systems of Water Supply and Sewage Disposal.

CITY OR TOWN	POPULATION, 1910		Date of introduction	Ownership *	Source of Supply	Purification	SEWERAGE	
	With Water Supply	Without Water Supply					Miles of Sewers (approx.)	Stream Receiving Sewage
Richmond	127,628			M.	James river	Sedimentation and coagulation with alum	110	James river.
Norfolk	67,462		1879	M.	Lakes and water shed	Mechanical filters	†75	Harbor.
Roanoke	34,874		1884	M.	Springs and water shed			Roanoke river
Portsmouth	33,190		1888	P.	Lake Kilby	Mechanical filters	20	Harbor.
Lynchburg	29,494		1907	M.	Pedlar river	Storage (500 mil. gals.)	45	James river.
Petersburg	24,127			M.	Water shed	Mechanical filters	24	Appomattox river.
Newport News	20,205		1892	P.	Lee's Mill water shed	Mechanical filters and hypochlorite	26	Hampton roads.
Danville	19,020		1875	M.	Dan river	Mechanical filters	20	Dan river.
Alexandria	15,329			P.	Cameron run			Potomac river.
Staunton	10,604		1875	M.	Limestone springs			Lewis creek.
Suffolk	7,008		1888	P.	Lake Kilby	Mechanical filters	7	Nansemond river.
Charlottesville	6,765		1887	M.	Protected water shed		11	Rivanna river.
Bristol	6,247		1889	M.	Springs		5	Beaver creek.
Fredericksburg	5,874		1894	M.	Rappahannock	Settling basin		Rappahannock river.
Winchester	5,864		1894	M.	Springs		8	Disposal plant. Effluent into Abrams creek.
Clifton Forge	5,748		1899	M.	Mountain creek and springs		10	Jackson river.
Hampton	5,505		1892	P.	Newport News Light and Water Co.	Mechanical filters and hypochlorite	4	Hampton creek.
Berkley	5,000		1888	P.	Lake Kilby	Mechanical filters		Harbor.
Harrisonburg	4,879		1897	M.	Dry river		8	Blacks run.
Pulaski	4,807		1910	M.	Protected water shed		†	Peak creek.
Covington	4,234			M.	Laurel run and spgs.			Jackson river.
Radford	4,204		1890	P.	Conley run and spgs.			New river.
Salem	3,849			M.	Spgs. and drilled well			Roanoke river.
South Boston	3,516		1888	M.	Dan river		2.5	Dan river.
Martinsville	3,368		1904	M.	Jones creek	Mechanical filter	7.	Smith river.
Buena Vista	3,245		1888	M.	Mountain streams		None	
Wytheville	3,054		1896	M.	Springs	Mechanical filter	4.	Reed creek.
Farmville	2,971			M.	Buffalo river		3.	Appomattox river.
Lexington	2,971		1890	M.	Moore's creek and springs		2.	North river.

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TABLE IV—CONTINUED.

POPULATION, 1910	Number of places of given population having public water supplies	Total population of places in preceding column	Number of places of given population not having public water supplies	Total population of places in preceding column
Above 5,000	18	429,944		
4,000-5,000	4	18,124		
3,000-4,000	5	17,082		
2,000-3,000	9	22,902	1	2,714
1,500-2,000	15	26,454		
1,000-1,500	13	16,789	9	10,542
500-1,000	19	14,071	34	21,685
	83	545,316	44	34,941

NOTE.—Total population of State, 2,061,612.

Summary.

PLACES OF POPULATION OVER 500, WITH	Number	Total Population
Water supply and sewerage	59	517,244
Water supply and no sewerage	22	25,904
No water supply or sewerage	44	34,941
Sewage discharging into tidal waters	9	138,906
Sewage discharging into rivers and streams	50	380,343
Plants for sewage treatment	2	6,565
Surface water supply and purification plant	16	329,307
Surface water supply and no purification plant	19	87,923
Supply from springs	25	50,836
Supply from wells	13	14,925
Supply from springs and well	4	8,363
Combined surface and ground supply	6	53,959
With no water works	44	34,941

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TABLE IV.—Concluded.

D.—General Statistics as to Existing Systems of Water Supply and Sewage Disposal.

CITY OR TOWN	POPULATION, 1910		Date of introduction	Ownership *	Source of Supply	Purification	SEWERAGE	
	With Water Supply	Without Water Supply					Miles of Sewers (approx.)	Stream Receiving Sewage
Richmond	127,628			M.	James river	Sedimentation and coagulation with alum	110	James river.
Norfolk	67,462		1879	M.	Lakes and water shed	Mechanical filters	†75	Harbor.
Roanoke	34,874		1884	M.	Springs and water shed			Roanoke river
Portsmouth	33,190		1888	P.	Lake Kilby	Mechanical filters	20	Harbor.
Lynchburg	29,494		1907	M.	Pedlar river	Storage (500 mil. gals.)	45	James river.
Petersburg	24,127			M.	Water shed	Mechanical filters	24	Appomattox river.
Newport News	20,205		1892	P.	Lee's Mill water shed	Mechanical filters and hypochlorite	26	Hampton roads.
Danville	19,020		1875	M.	Dan river	Mechanical filters	20	Dan river.
Alexandria	15,329			P.	Cameron run			Potomac river.
Staunton	10,604		1875	M.	Limestone springs			Lewis creek.
Suffolk	7,008		1888	P.	Lake Kilby	Mechanical filters	7	Nansemond river.
Charlottesville	6,765		1887	M.	Protected water shed		11	Rivanna river.
Bristol	6,247		1889	M.	Springs		5	Beaver creek.
Fredericksburg	5,874		1894	M.	Rappahannock	Settling basin		Rappahannock river.
Winchester	5,864		1894	M.	Springs		8	Disposal plant. Effluent into Abrams creek.
Clifton Forge	5,748		1899	M.	Mountain creek and springs		10	Jackson river.
Hampton	5,505		1892	P.	Newport News Light and Water Co	Mechanical filters and hypochlorite	4	Hampton creek.
Berkley	5,000		1888	P.	Lake Kilby	Mechanical filters		Harbor.
Harrisonburg	4,879		1897	M.	Dry river		8	Blacks run.
Pulaski	4,807		1910	M.	Protected water shed		†	Peak creek.
Covington	4,234			M.	Laurel run and spgs.			Jackson river.
Radford	4,204		1890	P.	Conley run and spgs.			New river.
Salem	3,849			M.	Spgs. and drilled well			Roanoke river.
South Boston	3,516		1888	M.	Dan river		2.5	Dan river.
Martinsville	3,368		1904	M.	Jones creek	Mechanical filter	7.	Smith river.
Buena Vista	3,245		1888	M.	Mountain streams		None	
Wytheville	3,064		1896	M.	Springs	Mechanical filter	4.	Reed creek.
Farmville	2,971			M.	Buffalo river		3.	Appomattox river.
Lexington	2,971		1880	M.	Moore's creek and springs		2.	North river.

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TABLE IV—CONTINUED.

CITY OR TOWN	POPULATION, 1910		Date of introduction	Ownership *	Source of Supply	Purification	SEWERAGE	
	With Water Supply	Without Water Supply					Miles of sewers (approx.)	Stream Receiving Sewage
Marion	2,727			M.	Mountain springs			
Williamsburg		2,714					None	
Big Stone Gap	2,590		1890	M.	Head waters of south fork of Powell's river		3.	Powell's river.
Bedford	2,508		1885	M.	Springs		5.	Otter creek.
Pocahontas	2,452				Abb's creek			
Phoebus	2,394		1892	P.	Newport News Light and Water Co.	Mechanical filter and hypochlorite	3.	Hampton creek.
Franklin	2,271		1906	M.	Blackwater river		2.	Blackwater river.
Emporia	2,018		1907	M.	Meherrin river	Mechanical filters		Meherrin river.
Cape Charles	1,949		1896	P.	Driven wells		3.	Chesapeake bay.
Vinton	1,928			P.	Spgs. and water shed			
Graham	1,917		1908	M.	Bluestone river		None	
Norton	1,869			P.	Mountain streams		6.5	Guest river.
Highland Park	1,817		1910	M.	Well			
Fortress Monroe	1,804		1892	P.	Newport News Light and Water Co.	Mechanical filters and hypochlorite	1.5	Hampton roads.
Crewe	1,802		1887		Stream		None	
Culpeper	1,795		1895	M.	Hungry run			Mountain run.
Abingdon	1,757		1889	P.	Spring		†10	Wolf creek.
Lawrenceville	1,733		1912	M.	Great creek	Mechanical filters	3	Great creek.
Chase City	1,662		†	M.	Drilled wells		†6	Bluestone creek.
Basic City	1,632		1892	M.	Lithia spring		None	
Saltville	1,628		1892	P.	Springs		3	Holston river.
Leesburg	1,597		1906	M.	Spg. and drilled well		0.5	Tuscarora creek.
Christiansburg	1,568		1911	M.	Springs		None	
Blackstone	1,486		1904	M.	Well and springs		2	Jack's branch.
Shenandoah	1,481		1906	M.	Shenandoah river		None	
Warrenton	1,481		1892	M.	Springs and well		None	
Chincoteague		1,419					None	
West Point	1,397		1904	M.	Artesian well			York river.
Waynesboro	1,389		1897	M.	Spring		1.	Shenandoah river.
Barton Heights	1,368				Well			
Ashland		1,324					None	

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Woodstock	1,314		1900	M.	Springs		None	
Tangier		1,300					None	
Smithfield	1,278		1901	P.	Artesian well		1	Pagan river.
Tazewell	1,230		1887	M.	Springs		None	
Luray	1,218		1900	M.	Mountain springs		None	
Manassas		1,217					None	
Front Royal	1,133		1891	M.	Water shed		None	
Falls Church		1,128					None	
Chatham	1,113		1884	M.	Springs		*1.5	Creek.
Appalachia		1,090					None	
Waverly		1,064					None	
Onancock	1,001			M.	Driven and dug well		None	
Loowmoor		1,000					None	
Arlington		1,000					None	
Rocky Mount	967				*Well		†	
Rural Retreat		900					None	
Lebanon	893		1907	M.	Spring		1	Little Cedar creek.
Berryville	876		1900	M.	Springs		None	
Blacksburg	875		1911	M.	Spring		1.5	Stroubles creek.
Elkton	873		1891	P.	Spring		0.5	Shenandoah river.
Honaker		869					None	
Wise		806					None	
Herndon		802					None	
West Norfolk	800							
Parksley		800					None	
Churchland		800						
Hot Springs	800				Spring			Jackson river.
Clarksville		794					None	
Pennington Gap	792						None	
Buchanan	792				Springs		None	
Strasburg	762		1904	M.	Springs		None	
Richlands	743		1909	P.	Clinch river		None	
South Hill	732		1912	P.	Drilled well		None	
Colonial Beach	721		†	M.	Driven wells		†	Potomac river.
Drakes Branch		708					None	
Accomac		700					None	
Paint Bank		700					None	
Reedville		700					None	
Victoria		682					None	
Orange	674		1911	M.	Drilled well		None	
Riverton	670		1891		Front Royal supply		None	
Winterpock		656					None	
Burkeville		653					None	
Coeburn		645					None	
Newmarket		638					None	
Claremont		630					None	
Altavista	600				Springs		1.5	Roanoke river.
Gate City	599				Spring		None	
Gilmerton		580					None	
Edinburg	570		1907	M.	Springs		None	

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TABLE IV—CONTINUED.

CITY OR TOWN	POPULATION, 1910		Date of introduction	Ownership*	Source of Supply	Purification	SEWERAGE	
	With Water Supply	Without Water Supply					Miles of Sewers (approx.)	Stream Receiving Sewage
Wakefield		564					None	
Gordonsville	564		1890	M.	Springs		None	
Ivanhoe		560					None	
Ocean View	560			P.	Wells			
New River Depot		550					None	
Rosslyn		550					None	
Cambria		535					None	
Saxis		530					None	
Houston		516					None	
Dayton		516					None	
Greenbackville		510					None	
Brookneal		504					None	
Ettricks		500					None	
Appomattox		500					None	
Cedar Bluff		500					None	
Fairport		500					None	
Max Meadows		500					None	

*M. Municipal. P. Private.
†Under construction or enlargements being made.

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TABLE IV—CONTINUED.

E.—Bond Issues for Proposed Improvements.

During the past year reports regarding proposed bond issues for water works and sewerage have been received from the towns listed below, with the amount thereof, etc., as noted. In some cases no reply has been received to inquiries and improvements are therefore not recorded:

CITY OR TOWN	BOND ISSUE	DATE	SYSTEM	REMARKS
Abingdon	$35,000 00	July 16th	Sewerage	New system.
Bridgewater	25,000 00	June	Water and sewerage	New system.
Chase City	45,000 00	August 29th	Water and sewerage	New system.
Chatham	8,000 00	April 18th	Sewerage	New system.
Chatham	2,000 00	April 18th	Water meters.	
Clifton Forge	190,000 00	April 23d	Water	Purchase of present system from company.
Colonial Beach	17,000 00	March	Water	New system.
Colonial Beach	20,000 00	March	Sewerage	New system.
Culpeper		June 22d	Mechanical filter	Council voted for installation.
Dublin	10,000 00	June	Water and sewerage	Extension.
Gordonsville	10,000 00	March	Water.	
Graham	15,000 00	April	Water	Extension and improvements.
Lawrenceville	50,000 00	February	Water sewerage and electric plant	New system.
Pulaski	50,000 00	September	Sewerage	New system.
Rocky Mount	50,000 00	July	Water and sewerage	New system.
South Hill		April	Water works	System installed by private company; capital stock, $10,000.
Stuart		March	Water works	Stuart Water Co., capital stock, $5,000; incorporated.

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APPENDIX SIX.

Report of the Bureau of Vital Statistics.

W. A. PLECKER, M. D.,
Assistant Registrar in Charge.

The work of preparing for the enforcement of the law for the registration of births and deaths in Virginia was actively entered upon by the writer on June 1, 1912, two weeks before the statute became effective. Much preliminary and educational work had already been done, which is more fully explained in the report of the publicity bureau. Local registrars, who, for the counties, are justices of the peace, were appointed in May. Contracts for printing the thirty-one forms necessary for work had been let as soon as possible after learning that the board and not the public printer would be responsible for it. Unfortunately, however, much delay was experienced in securing several of the most important of these. This prevented our getting all the needed forms into the hands of the registrars in advance, particularly the birth blanks, and caused much correspondence in the early summer, when our time was needed for other purposes.

Our registrars were, however, able to do fairly good work, almost from the start. The first reports from them showed results, which, under the circumstances, were quite creditable. The first monthly reports covering the last sixteen days of June, began to be received on July 1, ten days ahead of time. This caused some confusion, but it demonstrated that many registrars did not fully understand the scope of the law and the methods of work. Hundreds asked for further instruction and for the needed supplies which we did not have ready for distribution.

While these inquiries were being laborously answered by letter the bureau of publicity was preparing a second vital statistics bulletin which we issued July 15. This contained, in addition to the law, sets of instructions to local registrars, physicians, undertakers and midwives, as complete as our knowledge of existing needs permitted us to make them. This bulletin answered the questions most frequently asked, and besides being mailed to all of these classes, has since been sent out by hundreds, blue-penciled, in answer to individual questioners. By a careful system of pointing out individual omissions and errors, a large percentage of registrars are now sending their reports in fairly good form.

A most important part of our work has been the appointment and proper distribution of registrars so that one may be within easy reach of every family in the State. Unfortunately, the justices of the peace were frequently living near one another, or were otherwise unfavorably located. In some such instances, to relieve this situation, one registrar has relinquished his duties in favor of the other. As time has permitted, the assistant registrar has made a careful study of the subject, county by county, studying the map to discover vacant or neglected territory. By correspondence these are gradually being filled.

A most valuable asset to our work has been the September, 1912 bulletin, containing a list of physicians and health officers by counties and of local

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registrars by counties and districts. These have been mailed to physicians, registrars, undertakers and others, and serve to instruct these persons as to who is the registrar for any particular locality.

The most gratifying part of our work has been to observe the favorable reception which the law has received from all persons interested. The medical profession, with rare exceptions, has given hearty support to its enforcement, and many of our most valued registrars are physicians who were appointed to supply local needs. Even fewer undertakers have complained of the extra responsibility imposed upon them. The general public has readily appreciated the great value of the work and is aiding splendidly in the enforcement of the law.

The most difficult problem in the registration of births has been that large numbers of these are attended by colored midwives, who are frequently the most ignorant of their kind. These do not receive mail regularly, cannot read and cannot be reached readily from our office. These, however, when once clearly instructed by the registrar, report quite promptly.

A word as to results. Being handicapped by a lack of funds, we have been compelled to abandon all idea of fully studying our reports. We have, therefore, put almost our entire effort into organization and into perfecting our system of securing complete returns. Even here we cannot do the work as efficiently as is desired owing to a lack of clerical force and to the expensive item of postage. In addition we have devised a simple method of keeping our accounts with the local registrars. This can be done by my one assistant in the course of opening, inspecting and filing the certificates without perceptible cost of time. Our system of indexing by colored cards automatically separates deaths and births into color and sex. These may be readily counted.

The necessity for using about $1,800 for supplies from the first year's appropriation has forced us to economize even to the point of dismissing our stenographer. This additional work has been taken over by the assistant registrar. It is hoped that by strict saving a clerk can be employed to do the indexing, for as yet we have only been able to do enough of this to demonstrate the practical work of our system.

Many parents have taken advantage of our offer to bind, index and preserve records of the birth of children prior to June 14, 1912. At little additional cost it would be possible to project this system back indefinitely, thus enabling our people to record permanently known facts in connection with all members of their immediate families and past ancestry.

We are hoping that the next legislature will supply us with the means adequate to compile and to study our statistics. In the meanwhile we are completing our organization and are preparing the way for the more perfect recording and utilization of the vital statistics of the State when the time comes.

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APPENDIX SEVEN.

Report of the Resident Physician of the Catawba Sanatorium.

Prepared in accordance with the suggestions of the National Association for the Study and Prevention of Tuberculosis.

JOHN J. LLOYD, JR., M. D.,
Resident Physician.

I herewith submit the third annual medical report of Catawba Sanatorium, which covers the twelve months beginning October 1, 1911, and ending September 30, 1912:

Number of patients treated during the year	377
Number of patients in sanatorium September 30	111
Number of patients to be reported on	266

Nos. 425 and 546 remained in the sanatorium less than two days and are not included in this report.

DEFINITIONS OF TERMS EMPLOYED.

The definitions in the tables below are those recommended by the nomenclature committee of the National Association for the Cure and Prevention of Tuberculosis, to give a basis for comparison of results of the several institutions engaged in this work:

1. *Incipient (favorable).*—Slight initial lesion in the form of infiltration limited to the apices of both lungs or a small part of one lobe.

No tuberculosis complications. Slight or no constitutional symptoms (particularly including gastric or intestinal disturbances or rapid loss of weight).

Slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours, especially after rest.

Expectoration usually small in amount, or absent. Tubercle bacilli may be present or absent.

2. *Moderately Advanced.*—No marked impairment of function, either local or constitutional.

Localized consolidation moderate in extent with little or no evidence of destruction of tissue; or disseminated fibroid deposits.

No serious complications.

3. *Far Advanced.*—Marked impairment of function, local and constitutional.

Localized consolidation intense; or disseminated areas of softening or serious complications.

4. *Acute Miliary Tuberculosis.*

CONDITION ON DISCHARGE.

1. *Progressive (unimproved).*—All essential symptoms and signs unabated or increased.

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2. *Improved.*—Constitutional symptoms lessened or entirely absent. Physical signs improved or unchanged. Cough and expectoration with bacilli usually present.

3. *Arrested.*—Absence of all constitutional symptoms—expectoration and bacilli may or may not be present; physical signs stationary or retrogressive; the foregoing conditions to have existed *two* months.

4. *Apparently Cured.*—All constitutional symptoms and expectoration with bacilli absent for at least *three* months; the physical signs to be those of a healed lesion.

5. *Cured.*—All constitutional symptoms and expectoration with bacilli absent for at least two years under ordinary conditions of life.

TABLE I.

Class 1.—*Patients Who Remained Less Than Three Months.*

CONDITION ON ADMISSION.	Arrested	Imp.	Prog.	Died
Incipient 21 or 20%-	5	16		
Moderately advanced 47 or 45%-	1	33	11	2
Far advanced 37 or 35%-		9	23	5
	6	58	34	7

Non-tuberculous 2, not included. Total, 105.

Class 2.—*Patients Who Remained Three Months and More.*

CONDITION ON ADMISSION	Arrested	Imp.	Prog.	Died
Incipient 36 or 23%-	9	27		
Moderately advanced 75 or 47%-	13	55	6	1
Far advanced 48 or 30%-	1	29	15	3
	23	111	21	4

Total, 159.

TABLE II.

Result of Treatment as Shown by Weight.

Class 1.—*Patients Who Remained Less Than Three Months.*

Gained	62	Average gain	8
Stationary	4	Average loss	1
Lost	2	Average stay	54 days
Not weighed	41	Longest stay	87 days
	109	Shortest stay	4 days

Class 2.—*Patients Who Remained Three Months or More.*

Gained	119	Average gain	15
Stationary	4	Average loss	8
Lost	1	Average stay	204 days
Not weighed	35	Longest stay	686 days
		Shortest stay	90 days

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TABLE III.

Summary.

CLASS 1

Extent of physical signs according to Turban	T. B. found at any time	Hygienic-dietetic treatment without tuberculin. Patients who stayed over 90 days. Average residence 231 days				
		Cases	Arrested	Imp.	Prog.	Dead
Incipient 1	Neg. 10	19	5	14		
Incipient 1	Pos. 9					
Mod. advanced 1						
Mod. advanced 1						
Mod. advanced 11	Neg. 11	33	6	23	3	1
Mod. advanced 11	Pos. 20					
Mod. advanced 111						
Mod. advanced 111	Pos. 2					
Far advanced 111	Neg. 1					
Far advanced 111	Pos. 9	10	1	7	1	1
Total		62	12	44	4	2

CLASS 2

Extent of physical signs according to Turban	T. B. found at any time	Hygienic-dietetic treatment without tuberculin. Patients who stayed over 90 days. Average residence 174.5 days				
		Cases	Arrested	Imp.	Prog.	Dead
Incipient 1	Neg. 5	17	4	13		
Incipient 1	Pos. 12					
Mod. advanced 1	Pos. 1					
Mod. advanced 1						
Mod. advanced 11	Pos. 33	41	7	30	4	
Mod. advanced 11	Neg. 7					
Mod. advanced 111						
Mod. advanced 111						
Far advanced 111	Pos. 34					
Far advanced 111	Neg. 5	39		23	14	2
Total		97	11	66	18	2

TABLE IV.

After Results of Patients.

Conditions October 1, 1912, *of all Patients Discharged from the Sanatorium Three Months or More.*

CONDITION ON DISCHARGE	Cases	Improved	Stationary	Progress	Dead
Incipient	73	52	8	7	6
Mod. advanced	149	79	22	18	30
Far advanced	94	29	12	19	34
Total	316	160	42	44	70

As this year we made our first attempt to trace discharged patients, we were able to ascertain the condition of 316 out of a total of 566; the others who are lost are not tabluated above.

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TABLE V.

Geographical Distribution by Counties.

Accomac	1	Loudoun	1
Amelia	3	Lee	4
Albemarle	4	Mathews	1
Alexandria	3	Mecklenburg	1
Alleghany	2	Montgomery	3
Amherst	2	Northumberland	2
Appomattox	2	Nansemond	2
Augusta	3	Norfolk	12
Bedford	2	Nottoway	2
Botetourt	3	Nelson	2
Chesterfield	1	Orange	2
Carroll	1	Prince Edward	2
Campbell	30	Princess Anne	1
Charlotte	3	Prince William	1
Craig	1	Patrick	1
Cumberland	2	Pittsylvania	18
Dinwiddie	2	Pulaski	1
Elizabeth City	1	Richmond	1
Franklin	6	Roanoke	37
Floyd	3	Rockingham	4
Fairfax	2	Russell	3
Fauquier	4	Rockbridge	4
Frederick	5	Spotsylvania	2
Goochland	1	Southampton	3
Grayson	1	Surry	3
Hanover	1	Shenandoah	2
Henrico	38	Scott	1
Henry	1	Smyth	2
Halifax	1	Tazewell	1
Highland	2	Warwick	1
Isle of Wight	1	Washington	3
James City	1	Wise	4
Lancaster	1	Wythe	4
Louisa	1	York	1

One from Mann's Choice, Pa., and one from Salisbury, Md., making a total of 268.

TABLE VI.

Occupation of Patients.

Housework	71	Insurance agent	5
Clerks	36	Stenographers	7
Farmers	27	Civil engineer	3
Salesman	11	Druggist	3
Students	11	Mail carrier	3
Nurse	8	Usher	1
None	6	Foundry	1
Printer	1	Electrician	2
Driver	1	Minister	1
Laboratory work	1	Operator	1
Machinist	4	Orderly	1
Oystering	2	Factory	1
Paper hanger	2	Waiter	1
Barber	2	Railroad	5
Manufacturer	1	Carpenter	3
Foreman	3	Laborer	3
Merchants	6	Newspaper	3
Real estate agent	2	Draftsman	2
Shoemaker	3	Physicians	2
Bookkeeper	2	Lawyer	1
Miner	2	Boilermaker	1
Cashier	1	Presser	1
Teacher	6	Guard	1
Plumber	2	Policeman	1
Tobacconist	1		
Conductor	2	Total	268
Liveryman	1		

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CONCLUSIONS.

A study of the above tables well illustrates the following points:

1st. The extreme importance of early diagnosis and treatment.

2d. The advisability of a prolonged stay in the sanatorium as the result obtained in the cases who remained three months and more is much better than in those cases remaining a shorter time.

3d. The average gain in weight shows a material increase over that of our last annual report in both Class 1 and Class 2, and serves to demonstrate the benefit of absolute rest in bed, which is insisted upon in practically all cases running active symptoms.

4th. The result in the tuberculin treated cases seems to speak strongly for tuberculin in suitable cases.

5th. We have been able to trace a little more than fifty per cent. of our discharged patients, and we feel that the result as shown in the reports received is quite satisfactory. Next year we hope to have very few patients reported as lost.

6th. The country districts are apparently becoming more awakened to the tuberculosis situation, but we are still receiving too few applications from the outlying districts—22 of the 100 counties have had no patients here during the past year.

NURSES' TRAINING SCHOOL.

Our training school continues to be a source of great satisfaction to us, and we feel that by having it we are enabled to give to our patients the best nursing attention. In May past our first class of four nurses graduated, and we feel that they will be a credit to the institution.

NEEDS AND RECOMMENDATIONS.

The experience of the winter of 1912 have convinced us of the necessity of establishing a reception hospital on the main line of the railroad. Here all patients can be received and only the earlier, ambulant cases sent to the sanatorium for treatment.

The sanatorium was intended and designed for early cases and is suitable neither in location nor construction for the care of advanced cases.

As we are continually receiving requests to admit children, we feel there is a need for a children's ward to accommodate ten or more and hope the money may be obtained to erect and equip such a ward.

The forty-bed infirmary, the contract having been let, will fill a long felt want, as we have between forty and fifty bed patients at all times. This addition will in large measure care for our waiting list, which in the spring, summer and fall months numbers forty to sixty, and on the day this report is submitted numbers forty.

The office building is very inadequate for our present needs and after our capacity is increased, by the completion of the infirmary, we do not see how the necessary work can be economically accomplished unless our quarters are enlarged.

The addition to the dining room, which we now use as an amusement hall, adds very materially to the pleasure of the patients and will be sadly

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missed when we are compelled to use it for caring for the additional patients in the dining room. A recreation building, combining reading room, amusement hall and workshop, is sadly needed and we hope the next appropriation will provide for this.

In conclusion, we wish to express our thanks to the entire staff, but most especially to our nurses, through whose faithful services the work has been much facilitated.

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TABLE VII.

Tabulation of Individual Cases Discharged During Year Ending September 30, 1912.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban).		Duration in months	General condition	Digestion	Weight.			Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin.			
			Both lungs	Each lung				Admission	Highest San. weight	Normal weight					Variety	Maximum dose-mgs.	Number of days	Number of doses
371 M. 29	A D	Far Adv. Unimp.	111 111	R.1 L.2 R.1 L.2	11	Unfav. Unfav.	Unimp. Unimp.				116-80 116-90	100 99	Pos. Pos.					
372 F. 22	A D	Far Adv. Prog.	111 111	R.1 L.2 R.1 L.2	24	Unfav. Unfav.	Imp. Imp.			121	108-96 120-96	99.8 100.8	Pos. Pos.	Pelvic Inf. T. B. larynx				
373 F. 23	A D	Incipient Improved	1 1	R.1 L.1 R.1 L.1	7	Fav. Fav.	Unimp. Unimp.	134 138	138	138	88-72 88-76	97.8 98	Neg. Neg.					
374 M. 30	A D	Far. Adv. Improved	111 111	R.2 L.2 R.2 L.2	12	Unfav. Unfav.	Unimp. Unimp.	100	104	108	120-92 104-90	99.8 98.8	Pos. Pos.	T. B. larynx				
375 F. 25	A D	Far Adv. Prog.	111 111	R.3 L.1 R.2 L.2	19	Unfav. Unfav.	Unimp. Unimp.	113	121	125	112-96 120-96	98.4 101	Pos. Pos.					
376 F. 21	A D	Incipient Improved	1 1	L.1 L.1	10	Fav. Fav.	Unimp. Unimp.	110	111	112	90-84 90-80	98.6 98.6	Neg. Neg.					
377 F. 30	A D	Incipient Improved	1 1	R.1 L.1 R.1 L.1	7	Fav. Fav.	Unimp. Unimp.	111	112	120	96-80 92-80	99 98.6	Neg. Neg.					
378 M. 31	A D	Far Adv. Improved	111 111	R.3 L.2	104	Unfav. Unfav.	Unimp. Unimp.	147	172	150	112-92 88-76	98.8 98.6	Pos. Pos.	T. B. larynx	B. E.	1-15000	36	7
379 F. 41	A D	Mod. Adv. Improved	11	R.2 L.1	11	Fav. Fav.	Unimp. Unimp.	89	98	106	96-84 88-76	99.4 98.6	Pos. Pos.	T. B. larynx	B. E.	1-40000	17	3
380 M. 16	A D	Far. Adv. Prog.	111	R.3 L.2	14	Unfav. Unfav.	Unimp. Unimp.	118	118	124	116-100 112-94	101.6 100.6	Pos. Pos.	T. B. larynx				
381 M. 25	A D	Far Adv. Prog.	111	R.2 L.2	6	Unfav. Unfav.	Imp. Imp.				128-100 120-104	101.8 101	Pos. Pos.					

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382 M. 28	A	Non T. B.													Non T. B.				
383 F. 27	A D	Mod. Adv. Improved	11	R.1	L.2	18	Unfav. Fav.	Unimp. Unimp.	104	115	112	96-84 84-72	97.6 98.6	Pos. Pos.					
384 M. 36	A D	Mod. Adv. Prog.	11	R.1	L.2	8	Unfav. Unfav.	Imp. Imp.	144	149	165	114-100 108-98	99.6 100	Pos. Pos.	T. B. larynx				
385 M. 44	A D	Mod. Adv. Improved	11	R.1	L.2	13	Fav. Fav.	Unimp. Unimp.	137	148	150	84-76 84-64	98.6 98	Pos. Pos.	T. B. larynx				
386 F. 24	A D	Mod. Adv. Prog.	11	R.2	L.1	10	Unfav. Unfav.	Imp. Imp.	136	137	130	98-72 100-92	99 99.2	Pos. Pos.	Pregnancy				
387 M. 34	A D	Mod. Adv. Prog.	11	R.1	L.2	48	Unfav. Unfav.	Unimp. Unimp.	115	126	140	100-84 120-100	98.8 98.4	Neg. Neg.	T. B. larynx				
388 M. 26	A D	Mod. Adv. Improved	11	R.1	L.2	5	Fav. Fav.	Unimp. Unimp.	137	147	145	88-72 88-72	98.8 98.6	Pos. Pos.					
389 M. 29	A D	Mod. Adv. Improved	11	R.1	L.2	36	Fav. Fav.	Unimp. Unimp.	139	151	156	104-80 100-80	98.8 98.6	Pos. Pos.	T. B. larynx				
390 M. 28	A D	Mod. Adv. Improved	11	R.1	L.2		Fav. Fav.	Unimp. Unimp.	116	141	116	116-96 96-80	100 98.6	Pos. Pos.	T. B. larynx				
391 M. 37	A D	Mod. Adv. Improved	11	R.1	L.2	14	Fav. Fav.	Unimp. Unimp.	127	144	132	80-64 72-64	98.6 98.6	Pos. Pos.	T. B. larynx	B. E.	1-20000	42	7
392 F. 22	A D	Mod. Adv. Improved	11	R.3	L.1	14	Fav. Fav.	Unimp. Unimp.	98		112	118-100 96-84	98.8 99	Pos. Pos.	T. B. larynx				
393 F. 25	A D	Far Adv. Improved	111	R.2	L.2	7	Fav. Fav.	Unimp. Unimp.				112-96 100-92	100 99.6	Pos. Pos.					
394 M. 23	A D	Far Odv. Improved	111	R.2	L.2	10	Fav. Fav.	Unimp. Unimp.	127	149	135	128-100 108-96	100 99.2	Pos. Pos.	T. B. larynx				
395 M. 43	A D	Mod. Adv. Improved	11	R.2	L.1		Fav. Fav.	Unimp. Unimp.	130	141	170	88-72 88-72	99 98.4	Pos. Pos.					
396 F. 21	A D	Mod. Adv. Improved	11	L.2	R.1	4	Fav. Fav.	Unimp.	112	119	120	112-100	99.4	Neg.					
397 F. 29	A D	Incipient Improved	1	R.1	L.1	26	Fav. Fav.	Unimp. Unimp. Unimp.	106	107	115	96-84 112-88 90-88	99 99.2 99.2	Neg. Neg. Neg.					
398 F. 23	A D	Mod. Adv. Improved	11	R.1	L.2	38	Fav. Fav.	Unimp. Unimp.				120-106 108-96	100 100	Pos. Pos.					

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' five admission; days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Variety	Maximum dosage	Number of	Number of	Number of
399 M. 14	A D	Mod. Adv. Improved	11	R.2 L.1		Fav. Fav.	Unimp. Unimp.				116-96 108-96	100.8 101	Pos. Pos.						
400 M. 70	A D	Mod. Adv. Improved	11	R.1 L.1	10	Unfav. Unfav.	Unimp. Unimp.				96-74 90-64	98.8 98.8	Pos. Pos.						
401 F. 29	A D	Far Adv. Improved	111	R.2 L.2	29	Unfav. Unfav.	Unimp. Unimp.	91	112	105	120-104 96-80	100 98.8	Pos. Pos.						
402 F. 28	A D	Far Adv. Prog.	111	R.1 L.2	4	Unfav. Unfav.	Unimp. Unimp.				116-102 120-100	101 102	Pos. Pos.						
403 F. 23	A D	Incipient Improved	1	R.1 L.1		Fav. Fav.	Unimp. Unimp.	112	122	117	100-92 90-80	98.8 98.6	Neg. Neg.						
404 M. 41	A D	Far Adv. Died	111	R.2 L.2	13	Unfav. Unfav.	Imp. Imp.	134	137	150	104-82 120-100	100 99.4	Pos. Pos.	Pneumonia					
405 M. 29	A D	Far Adv. Improved	111	R.1 L.2	17	Fav. Fav.	Unimp. Unimp.	114	119	135	106-80 96-72	98.2 98.2	Pos. Pos.	T. B. larynx					
406 M. 20	A D	Mod. Adv. Improved	11	R.2	24	Fav. Fav.	Unimp. Unimp.	130	139	140	100-84 100-76	98 98.	Pos. Pos.	T. B. larynx & hemorrhages					
407 M. 35	A D	Mod. Adv. Improved	11	R.1 L.2		Fav. Fav.	Unimp. Unimp.	127	158	148	104-92 80-72	99.6 98.2	Pos. Pos.	Streak'd sputum					
408 M. 22	A D	Far Adv. Prog.	111	R.3 L.2	10	Unfav. Unfav.	Imp. Imp.				114-90 104-96	102 102	Pos. Pos.						
409 M. 46	A D	Mod. Adv. Died	11	R.2 L.1	10	Unfav.	Unimp.	132		165	106-84 100-92	100.8 101	Neg. Neg.	Hemorrhage					
410 M. 29	A D	Mod. Adv. Improved	11	R.2 L.1	11	Fav. Fav.	Unimp. Unimp.	143		155	96-78 94-84	98.8 98.4	Pos. Pos.						

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411 F. 44	A D	Incipient Improved	1	R.1	L.1	10	Fav. Fav.	Unimp. Unimp.	102	126	102	84–76 82–76	98.6 98.2	Neg. Neg.		B. E.	1–8000	119	16
412 F. 19	A D	Incipient Improved	1	L.1		10	Fav. Fav.	Unimp. Unimp.	88	100	90	100–80 92–80	99.2 98.6	Neg. Neg.					
413 F. 24	A D	Mod. Adv. Improved	11	R.2	L.1	25	Fav. Fav.	Unimp. Unimp.	110	114	104	96–78 92–84	98.6 98.6	Neg. Neg.					
414 F. 19	A D	Mod. Adv. Prog.	11	R.2	L.1	6	Unfav. Unfav.	Imp. Imp.	84		117	114–96 112–96	101.8 102.8	Pos. Pos.	T. B. enteritis				
415 F. 23	A D	Mod. Adv. Improved	11	R.2	L.2	12	Fav. Fav.	Imp. Unimp.	92	114	106	110–80 96–80	99 98.4	Pos. Pos.	T. B. larynx	B. E.	1–20000	105	9
416 F. 31	A D	Incipient Improved	1	L.1		18	Fav. Fav.	Unimp. Unimp.	182	191	180	98–88 84–72	99 98.6		T. B. larynx	B. E.	1–40000	8	2
417 F. 22	A D	Incipient Improved	1	R.1	L.1	9	Fav. Fav.	Unimp. Unimp.	128	136	135	96–82 92–74	98.4 98.4		T. B. larynx				
418 F. 20	A D	Incipient Improved	1	R.1	L.1	5	Fav. Fav.	Unimp. Unimp.	125	140	127	96–84 84–72	98.6 98.6		T. B. larynx	B. E.	1–15000	77	10
419 F. 38	A D	Mod. Adv. Improved	11	R.1	L.2	16	Fav. Fav.	Unimp. Unimp.	113	141	135	120–96 84–92	104 98.6	Pos. Pos.	T. B. larynx	B. E.	1–60000	28	4
420 F. 25	A D	Mod. Adv. Improved	11	R.2	L.2	12	Fav. Fav.	Unimp. Unimp.	108	127	118	116–92 84–92	101 98.8	Pos. Pos.					
421 M. 44	A D	Far Adv. Improved	111	R.3	L.1	67	Fav. Fav.	Unimp. Unimp.	138	153	155	100–88 100–86	99.8 99	Neg. Neg.					
422 F. 23	A D	Far. Adv. Prog.	111	R.2	L.2	15	Unfav. Unfav.	Unimp. Unimp.	105		120	136–16 116–100	101 102	Pos. Pos.	T. B. larynx				
423 M. 26	A D	Incipient Improved	1	R.1	L.1	48	Fav. Fav.	Unimp. Unimp.	128	154	132	84–72 92–80	98 98	Pos. Pos.					
424 M. 28	A D	Mod. Adv. Improved	11	R.1	L.2	4	Fav. Fav.	Unimp. Unimp.	126	130	135	100–88 92–84	99 98.8	Pos. Pos.	T. B. larynx				
425 M. 38	A D	Mod. Adv.	11	R.2	L.1		Fav.					92–80	99						
426 F. 48	A D	Incipient Improved	1	R.1	L.1	8	Fav. Fav.	Unimp. Unimp.	170	178	165	88–82 84–76	98 98	Pos. Pos.					
427 M. 22	A D	Incipient Arrested	1	R.1			Fav. Fav.	Unimp. Unimp.	162	188	160	88–76 80–72	98.6 98.6	Neg. Neg.		B. E.	1–8000	133	20

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin. Variety	Maximum dose-mgs.	Number of days	Number of doses
399 M. 14	A D	Mod. Adv. Improved	11	R.2 L.1		Fav. Fav.	Unimp. Unimp.				116-96 108-96	100.8 101	Pos. Pos.					
400 M. 70	A D	Mod. Adv. Improved	11	R.1 L.1	10	Unfav. Unfav.	Unimp. Unimp.				96-74 90-64	98.8 98.8	Pos. Pos.					
401 F. 29	A D	Far Adv. Improved	111	R.2 L.2	29	Unfav. Unfav.	Unimp. Unimp.	91	112	105	120-104 96-80	100 98.8	Pos. Pos.					
402 F. 28	A D	Far Adv. Prog.	111	R.1 L.2	4	Unfav. Unfav.	Unimp. Unimp.				116-102 120-100	101 102	Pos. Pos.					
403 F. 23	A D	Incipient Improved	1	R.1 L.1		Fav. Fav.	Unimp. Unimp.	112	122	117	100-92 90-80	98.8 98.6	Neg. Neg.					
404 M. 41	A D	Far Adv. Died	111	R.2 L.2	13	Unfav. Unfav.	Imp. Imp.	134	137	150	104-92 120-100	100 99.4	Pos. Pos.	Pneumonia				
405 M. 29	A D	Far Adv. Improved	111	R.1 L.2	17	Fav. Fav.	Unimp. Unimp.	114	119	135	106-80 96-72	98.2 98.2	Pos. Pos.	T. B. larynx				
406 M. 20	A D	Mod. Adv. Improved	11	R.2	24	Fav. Fav.	Unimp. Unimp.	130	139	140	100-84 100-76	98 98.	Pos. Pos.	T. B. larynx & hemorrhages				
407 M. 35	A D	Mod. Adv. Improved	11	R.1 L.2		Fav. Fav.	Unimp. Unimp.	127	153	148	104-92 80-72	99.6 98.2	Pos. Pos.	Streak'd sputum				
408 M. 22	A D	Far Adv. Prog.	111	R.3 L.2	10	Unfav. Unfav.	Imp. Imp.				114-90 104-96	102 102	Pos. Pos.					
409 M. 46	A D	Mod. Adv. Died	11	R.2 L.1	10	Unfav.	Unimp.	132		165	106-84 100-92	100.8 101	Neg. Neg.	Hemorrhage				
410 M. 29	A D	Mod. Adv. Improved	11	R.2 L.1	11	Fav. Fav.	Unimp. Unimp.	143		155	96-78 94-84	98.8 98.4	Pos. Pos.					

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411 F. 44	A D	Incipient Improved	1	R.1	L.1	10	Fav. Fav.	Unimp. Unimp.	102	126	102	84-76 82-76	98.6 98.2	Neg. Neg.		B. E.	1-8000	119	16
412 F. 19	A D	Incipient Improved	1	L.1		10	Fav. Fav.	Unimp. Unimp.	88	100	90	100-80 92-80	99.2 98.6	Neg. Neg.					
413 F. 24	A D	Mod. Adv. Improved	11	R.2	L.1	25	Fav. Fav.	Unimp. Unimp.	110	114	104	98-78 92-84	98.6 98.6	Neg. Neg.					
414 F. 19	A D	Mod. Adv. Prog.	11	R.2	L.1	6	Unfav. Unfav.	Imp. Imp.	84		117	114-96 112-96	101.8 102.8	Pos. Pos.	T. B. enteritis				
415 F. 23	A D	Mod. Adv. Improved	11	R.2	L.2	12	Fav. Fav.	Imp. Unimp.	92	114	106	110-80 96-80	99 98.4	Pos. Pos.	T. B. larynx	B. E.	1-20000	105	9
416 F. 31	A D	Incipient Improved	1	L.1		18	Fav. Fav.	Unimp. Unimp.	182	191	180	98-88 84-72	99 98.6		T. B. larynx	B. E.	1-40000	8	2
417 F. 22	A D	Incipient Improved	1	R.1	L.1	9	Fav. Fav.	Unimp. Unimp.	128	136	135	96-82 92-74	98.4 98.4		T. B. larynx				
418 F. 20	A D	Incipient Improved	1	R.1	L.1	5	Fav. Fav.	Unimp. Unimp.	125	140	127	96-84 84-72	98.6 98.6		T. B. larynx	B. E.	1-15000	77	10
419 F. 38	A D	Mod. Adv. Improved	11	R.1	L.2	16	Fav. Fav.	Unimp. Unimp.	113	141	135	120-96 84-92	104 98.6	Pos. Pos.	T. B. larynx	B. E.	1-60000	28	4
420 F. 25	A D	Mod. Adv. Improved	11	R.2	L.2	12	Fav. Fav.	Unimp. Unimp.	108	127	118	116-92 84-92	101 98.8	Pos. Pos.					
421 M. 44	A D	Far Adv. Improved	111	R.3	L.1	67	Fav. Fav.	Unimp. Unimp.	138	153	155	100-88 100-86	99.8 99	Neg. Neg.					
422 F. 23	A D	Far. Adv. Prog.	111	R.2	L.2	15	Unfav. Unfav.	Unimp. Unimp.	105		120	136-16 116-100	101 102	Pos. Pos.	T. B. larynx				
423 M. 26	A D	Incipient Improved	1	R.1	L.1	48	Fav. Fav.	Unimp. Unimp.	128	154	132	84-72 92-80	98 98	Pos. Pos.					
424 M. 28	A D	Mod. Adv. Improved	11	R.1	L.2	4	Fav. Fav.	Unimp. Unimp.	126	130	135	100-88 92-84	99 98.8	Pos. Pos.	T. B. larynx				
425 M. 38	A D	Mod. Adv.	11	R.2	L.1		Fav.					92-80	99						
426 F. 48	A D	Incipient Improved	1	R.1	L.1	8	Fav. Fav.	Unimp. Unimp.	170	173	165	88-82 84-76	98 98	Pos. Pos.					
427 M. 22	A D	Incipient Arrested	1	R.1			Fav. Fav.	Unimp. Unimp.	162	188	160	88-76 80-72	98.6 98.6	Neg. Neg.		B. E.	1-3000	133	20

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin. Variety	Maximum dose-mgs.	Number of days	Number of doses
428 F. 43	A D	Mod. Adv. Improved	11	R.1 L.2	12	Fav. Fav.	Unimp. Unimp.	113	131	120	96-76 88-76	99 98.4	Pos. Pos.					
429 F. 25	A D	Incipient Improved	1	R.1 L.1	6	Fav. Fav.	Unimp. Unimp.	127	143	162	96-80 88-80	98.4 98.4	Neg. Neg.	T. B. larynv				
430 M. 19	A D	Incipient Improved	1	R.1 L.1	14	Fav. Fav.	Unimp. Unimp.	123	153	134	104-92 80-72	99.4 98.4	Neg. Neg.	T. B. larynx	B. E.	1-10000	85	13
431 M. 31	A D	Incipient Improved	1	R.1	8	Fav. Fav.	Unimp. Unimp.	137	163	146	80-72 80-72	98.4 98	Neg. Neg.					
432 M. 27	A D	Mod. Adv. Improved	11	R.1 L.1	12	Fav. Fav.	Unimp. Unimp.	146	150	148	112-88 92-80	100.98	Pos. Pos.	T. B. larynx	B. E.	1-8000	84	13
433 M. 26	A D	Far Adv. Prog.	111	R.2 L.2	12	Unfav. Unfav.	Imp. Imp.				108-92 108-92	103 102.8	Pos. Pos.	T. B. larynx				
434 M. 31	A D	Incipient Improved	1	R.1	6	Fav. Fav.	Unimp. Unimp.	151	168	158	82-74 88-76	98.6 98.4	Pos. Pos.	T. B. larynx	B. E.	1-20000	42	5
435 F. 22	A D	Incipient Improved	1	R.1	10	Fav. Fav.	Unimp. Unimp.	93	111	95	100-80 88-72	99.4 99						
436 M. 31	A D	Mod. Adv. Improved	11	R.1 L.1	7	Fav. Fav.	Unimp. Unimp.	150	151	140	88-76 96-84	98.4 98.4	Pos. Pos.	Otitis media				
437 M. 19	A D	Mod. Adv. Improved	11	R.1 L2.		Fav. Fav.	Unimp. Unimp.	143	172	160	120-104 96-84	99.8 98	Pos. Pos.					
438 M. 20	A D	Incipient Improved	1	R.1 L.1	2	Fav. Fav.	Unimp. Unimp.	151	157	155	80-64 80-64	98.6 98	Neg. Neg.					
439 M. 15	A D	Incipient Improved	1	L.1	4	Fav. Fav.	Unimp. Unimp.	85	108	87	98-78 88-76	98.6 98.6						

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440 M. 18	A D	Mod. Adv. Improved	11	L.1	R.2	12	Fav. Fav.	Unimp. Unimp.	116	130	138	130-108 88-76	99 98.6	Neg. Neg.		B. E.	1-5000	155	23
441 M. 23	A D	Far Adv. Prog.	111	L.2	R.2	10	Unfav. Unfav.	Imp. Imp.				116-100 112-100	102 102.8	Pos. Pos.	T. B. larynx				
442 F. 23	A D	Incipient Improved	1	R.1	L.1	24	Fav. Fav.	Unimp. Unimp.	115	127	120	90-84 84-72	99 98.6	Pos. Pos.	T. B. larynx				
443 M. 31	A D	Mod. Adv. Died	11	R.2	L.1	48	Fav.	Imp.	120	130	145	96-88	98.4	Pos. Pos.	T. B. larynx	B. E.	1-30000	49	8
444 M. 27	A D	Mod. Adv. Improved	11	R.2	L.2	12	Unfav. Unfav.	Imp. Imp.				112-92 96-88	101.8 99.8	Pos. Pos.	T. B. larynx				
445 M. 23	A D	Far Adv. Prog.	111	R.3	L.1	25	Unfav. Unfav.	Imp. Imp.				116-96 112-96	98.8 99.4	Pos. Pos.					
446 M. 22	A D	Mod. Adv. Improved	11	R.1	L.1	20	Fav. Fav.	Unimp. Unimp.	123	144	158	100-88 88-76	99 98.4	Pos. Pos.	T. B. larynx	B. E.	1-8000	149	18
447 M. 18	A D	Mod. Adv. Improved	11	R.1	L.2	11	Fav. Fav.	Unimp. Unimp.	146	162	155	98-86 96-80	99 99	Neg. Neg.	T. B. larynx				
448 M. 26	A D	Far Adv. Prog.	111	R.2	L.2	5	Unfav. Unfav.	Imp. Imp.				126-108 116-104	101.8 102		T. B. larynx				
449 F. 32	A D	Mod. Adv. Improved	11	R.2	L.1	10	Fav. Fav.	Unimp. Unimp.	116	152	130	96-80 88-76	98.8 98.6	Neg. Neg.	T. B. larynx	B. E.	1-15000	115	17
450 M. 48	A D	Mod. Adv. Improved	11	R.1	L.2	16	Fav. Fav.	Unimp. Unimp.	117	127	125	96-80 88-72	98.6 98	Pos. Pos.	T. B. larynx				
451 F. 32	A D	Mod. Adv. Improved	11	R.2	L.1	36	Fav. Fav.	Unimp. Unimp.	99		115	100-88 92-80	100 100	Pos. Pos.	T. B. larynx				
452 M. 31	A D	Mod. Adv. Improved	11	R.1	L.2	12	Unfav. Unfav.	Imp. Imp.	126		135	112-94 100-92	100 101	Pos. Pos.		B. E.	1-20000	21	4
453 M. 34	A D	Far Adv. Died	111	R.2	L.1		Unfav.	Unimp.	107			92-84	100	Pos.	T. B. larynx	B. E.	1-40000	35	5
454 M. 25	A D	Mod. Adv. Improved	11	R.2		12	Fav. Fav.	Unimp. Unimp.	157	169	164	96-72 88-72	99 92.6	Pos. Pos.	T. B. larynx	B. E.	1-8000	155	20
455 M. 26	A D	Incipient Improved	1	R.1		10	Fav. Fav.	Unimp. Unimp.	120	137	148	82-76 80-76	98.6 98.6	Pos. Pos.	T. B. larynx	B. E.	1-20000	74	8
456 M. 19	A D	Incipient Improved	1	L.1		8	Fav. Fav.	Unimp. Unimp.	144	157	145	96-80 84-72	98.6 98.6	Neg. Neg.	Malaria				

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin. Variety	Maximum dose-mgs.	Number of days	Number of doses
457 M. 29	A D	Incipient Improved	1	R.1 L.1	8	Fav. Fav.	Unimp. Unimp.	131	141	125	94-80 86-68	99 98.2	Pos. Pos.	T. B. larynx	B. E.	1-10000	127	15
458 M. 26	A D	Incipient Improved	1	R.1	11	Fav. Fav.	Unimp. Unimp.	127	135	118	92-76 68-80	98.6 98.2	Pos. Pos.	T. B. larynx	B. E.	1-10000	134	18
459 M. 19	A D	Incipient Improved	1	R.1 L.1	12	Fav. Fav.	Unimp. Unimp.	132	146	135	88-72 76-68	98.8 98.2	Pos. Pos.	T. B. larynx	B. E.	1-10000	141	18
460 M. 27	A D	Far Adv. Died	111	R.2 L.2	60	Unfav.	Imp.	114	133	130	120-104	99	Pos.					
461 M. 54	A D	Far Adv. Prog.	111	R2. L.2	4	Unfav. Unfav.	Imp. Imp.				112-88	100	Pos. Pos.	T. B. larynx				
462 M. 34	A D	Incipient Arrested	1	R.1 L.1	19	Fav. Fav.	Unimp. Unimp.	142	197	155	100-80 76-84	99 98.4	Pos. Pos.		B. E.	1-15000	78	12
463 M. 27	A D	Mod. Adv. Prog.	11	R.2 L.2	9	Unfav. Unfav.	Imp. Imp.				90-76 88-76	101 102	Pos. Pos.	T. B. larynx				
464 F. 19	A D	Incipient Improved	1	R.1 L.1		Fav. Fav.	Unimp. Unimp.	120	149	125	90-108 100-76	99 98	Pos. Pos.	T. B. larynx	B. E.	1-15000	183	23
465 F. 21	A D	Incipient Improved	1	R.1 L.1	6	Fav. Fav.	Unimp. Unimp.	106	115	110	96-80 84-70	98.4 98.4	Pos. Pos.					
466 M. 72	A D	Mod. Adv. Improved	11	R.1 L.2	28	Unfav. Unfav.	Unimp. Unimp.	107	115	135	96-76 88-80	98.4 98.4	Pos. Pos.					
467 M. 39	A D	Mod. Adv. Improved	11	R.2 L.2	6	Fav. Fav.	Unimp. Unimp.	151	152	158	100-84	99.2	Pos. Pos.					
468 M. 37	A D	Mod. Adv. Arrested	11	R.2 L.1	12	Fav. Fav.	Unimp. Unimp.	139	174	158	96-80 84-70	99.2 98	Pos. Pos.		B. E.	1-20000	72	9

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469 F. 50	A D	Mod. Adv. Improved	11	R.2	L.2	53	Fav. Fav.	Unimp. Unimp.	88	88		116-96 100-88	100 98.4	Pos. Pos.					
470 M. 29	A D	Mod. Adv. Prog.	11	R.2	L.1	8	Unfav. Unfav.					104-96 100-90	101.4 100.8	Pos. Pos.					
471 M. 41	A D	Mod. Adv. Arrested	11	R.1	L.2	14	Fav. Fav.	Unimp. Unimp.	162	204	175	80-76 80-74	98.6 98.2	Neg. Neg.	T. B. larynx	B. E.	1-20000	141	14
472 M. 46	A D	Mod. Adv. Improved	11	R.2	L.1	7	Fav. Fav.	Unimp. Unimp.	127	140	135	96-80 80-72	98.6 98.6	Neg. Neg.					
473 M. 17	A D	Incipient Arrested	1	R.1	L.1	17	Fav. Fav.	Unimp. Unimp.	158	187	155	80-68 80-70	98.4 98	Neg. Neg.		B. E.	1-30000	28	5
474 F. 26	A D	Far Adv. Prog.	111	R.2	L.2	17	Unfav. Unfav.	Unimp. Imp.	111	124	130	104-92 124-100	99.8 101.8	Pos. Pos.	T. B. larynx	B. E.	1-10000	98	18
475 M. 27	A D	Far Adv. Prog.	111	R.2	L.2	28	Unfav. Fav.	Imp. Imp.	130	144	163	120-104 116-92	99 99	Pos. Pos.	Pericarditis Hydro-pneu- mothorax				
476 F. 44	A D	Mod. Adv. Improved	11	R.1	L.2	11	Fav. Fav.	Unimp. Unimp.	86		102	120-104 104-92	98.8 98.4	Pos. Pos.	T. B. larynx				
477 F. 57	A D	Mod. Adv. Improved	11	R.1	L.2	12	Fav. Fav.	Unimp. Unimp.	98	98½		100-76 80-68	98.8 98	Pos. Pos.	T. B. larynx				
478 M. 36	A D	Mod. Adv. Prog.	11	R.1	L.1	6	Fav. Unfav.	Imp. Imp.				104-88 108-92	98.8 100	Neg. Neg.	T. B. larynx				
479 F. 42	A D	Far Adv. Prog.	111	R.3	L.2	12	Unfav. Unfav.	Imp. Imp.				124-96 112-90	100.6 100	Pos. Pos.	T. B. enteritis T. B. larynx				
480 F. 57	A D	Far Adv. Prog.	111	R.3	L.2	3	Unfav. Unfav.	Imp. Imp.				116-90 116-90	98.8 100	Neg. Neg.	Diabetes				
481 M. 35	A D	Mod. Adv. Arrested	11	R.1	L.1	23	Fav. Fav.	Unimp. Unimp.	136	150	140	88-72 66-84	98.8 98.8	Neg. Neg.		B. E.	1-10000	106	15
482 M. 21	A D	Mod. Adv. Improved	11	R.2	L.1	3	Fav. Fav.	Unimp. Unimp.	128½	140	134	104-72 88-64	99 98	Pos. Pos.					
483 F. 26	A D	Mod. Adv. Improved	11	R.2	L.2	36	Fav. Fav.	Unimp. Unimp.	118½	145¼	124	112-80 92-80	99.2 99	Pos. Pos.		B. E.	1-8000	84	11
484 M. 28	A D	Mod. Adv. Improved	11	R.2	L.1	6	Fav. Fav.	Unimp. Unimp.	154½	180	160	96-88 92-76	98.6 98.6	Pos. Pos.		B. E.	1-20000	64	9
485 F. 35	A D	Mod. Adv. Prog.	1	R.1	L.1	4	Fav. Fav.	Unimp. Unimp.	114	129½	135	100-72 82-72	99 99.2	Pos. Pos.					

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin. Variety	Maximum dose-mgs.	Number of days	Number of doses
486 M. 18	A D	Mod. Adv. Prog.	11	R.3 L.1	36	Fav. Fav.	Unimp. Unimp.	127	139½	125	92-68 88-64	98.6 98.4	Pos. Pos.	T. B. larynx	B. E.	1-8000	156	22
487 M. 28	A D	Mod. Adv. Arrested	11	R.2 L.2	2	Fav. Fav.	Unimp. Unimp.	124	163	137	100-76 76-68	99 98.4	Pos. Neg.	T. B. larynx				
488 M. 27	A D	Incipient Improved	1	R.1 L.1	36	Fav. Fav.	Unimp. Unimp.	150½	153½	150	116-76 92-80	98.2 98	Pos. Neg.	T. B. larynx				
489 M. 27	A D	Mod. Adv. Improved	11	R.2 L.1	39	Fav. Fav.	Unimp. Unimp.	163½	157	135	72-60 76-60	98.6 98	Neg. Neg.	T. B. larynx				
490 M. 17	A D	Mod. Adv. Improved	11	R.2 L.1	12	Fav. Fav.	Unimp. Imp.	116	139½	132	112-76 104-92	98.6 98.4	Pos. Neg.	M. regurgitation T. B. larynx	B. E.	1-40000	240	31
491 F. 21	A D	Far Adv. Improved	111	R.1 L.3	'12	Unfav. Fav.	Unimp. Unimp.	105	125½	120	108-94 92-80	99.2 98.4	Pos. Neg.	T. B. larynx	B. E.	1-30000	188	18
492 M. 29	A D	Mod. Adv. Improved	11	R.2 L.1	31	Fav. Fav.	Imp. Imp.				100-68 84-68	98.4 98	Neg. Neg.					
493 F. —	A D	Incipient Improved	1	R.1 L.1		Fav. Fav.	Unimp. Unimp.	133½	133½	135	94-60 94-72	99 98.6	Neg. Neg.	T. B. tube & O	B. E	1-60000	8	2
494 M. 27	A D	Far Adv. Prog.	111	L.3 R.3		Unfav. Unfav.	Imp. Imp.				112-88 104-84	100.4 100	Pos. Pos.					
495 M. 30	A D	Far Adv. Prog.	111	R.3 L.2	12	Unfav. Unfav.	Unimp. Unimp.				112-88 104-84	101.6 101.6	Pos. Neg.					
496 M. 34	A D	Mod. Adv. Arrested	11	L.2 R.2	6	Unfav. Fav.	Unimp. Unimp.	130	140½	135	84-68 92-68	99 98	Pos. Pos.	T. B. larynx	B. E.	1-5000	277	31
497 M. 21	A D	Mod. Adv. Arrested	11	R.1 L.2	4	Fav. Fav.	Unimp. Unimp.	144	160	139	88-74 94-76	98.4 98.2	Pos. Neg.	T. B. larynx				

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498 M. 36	A D	Far Adv. Improved	111	R.3	L.3	9	Unfav. Fav.	Unimp. Unimp.	116	132½	135	120-88 92-84	99.2 98.4	Pos. Neg.	T. B. larynx				
499 M. 41	A D	Far Adv. Improved	111	L.3	R.2	5	Unfav. Fav.	Unimp. Unimp.	130½	150½	145	100-88 92-86	99.2 98.4	Pos. Neg.	T. B. larynx				
500 M. 20	A D	Incipient Improved	1	R.1	L.1	2	Fav. Fav.	Unimp. Unimp.	174½	175	170	56-44 64-50	98 98	Neg. Neg.	T. B. larynx				
501 F. 22	A D	Far Adv. Improved	111	R.2	L.3	6	Unfav. Fav.	Unimp. Unimp.	103		115	118-84 102-88	98.6 98	Pos. Neg.	T. B. larynx				
502 F. 22	A D	Far Adv. Improved	111	L.3	R.2	15	Unfav. Unfav.	Unimp. Unimp.	107½	110½	100	96-78 92-72	98.6 100	Neg. Neg.	T. B. larynx				
503 F. 29	A D	Far Adv. Improved	111	R.2	L.3	12	Unfav. Fav.	Unimp. Unimp.	118		100	116-94 108-96	100 100	Pos. Neg.	T. B. larynx	B. E.	1-20000	121	15
504 F. 30	A D	Mod. Adv. Improved	11	R.1	L.2	24	Fav. Fav.	Unimp. Unimp.	104½	111½	110	88-74 88-68	98.4 98	Neg. Neg.	T. B. larynx				
505 M. 20	A D	Mod. Adv. Improved	11	R.2	L.2		Fav. Fav.	Unimp. Unimp.	115	120	128	140-72 80-68	100 98.4	Pos. Pos.	T. B. larynx				
506 M. 32	A D	Mod. Adv. Improved	11	R.2	L.2	12	Fav. Fav.	Unimp. Unimp.	115½	128½	122	100-72 84-76	99 98.6	Pos. Pos.	T. B. larynx				
507 M. 22	A D	Mod. Adv. Improved	11	R.1	L.2	7	Fav. Fav.	Unimp. Unimp.	145	163½	150	96-76 90-70	98.4 98.2	Pos. Neg.		B. E.	1-6000	239	32
508 F. 19	A D	Far Adv. Improved	111	R.3	L.2	7	Unfav. Fav.	Unimp. Unimp.	117		135	116-100 114-90	100 101	Pos. Pos.					
509 M. 30	A D	Incipient Improved	1	R.1	L.1		Fav. Fav.	Unimp. Unimp.	127½	168		88-80 92-82	98.6	Neg. Neg.	Mitral stenosis				
510 F. 32	A D	Mod. Adv. Prog.	11	R.2	L.2	5	Fav. Fav.	Unimp. Unimp.	118	118	140	92-80 92-80	99.4 99.4	Neg. Neg.					
511 F. 24	A D	Incipient Improved	1	R.1	L.1	24	Fav. Fav.	Unimp. Unimp.	101½	122½	110	96-80 68-60	99.2 98	Pos. Neg.	T. B. larynx	B. E.	1-10—	205	24
512 F. 24	A D	Far Adv. Improved	111	R.3	L.2		Unfav. Fav.	Unimp. Unimp.				120-76 92-76	100 99.2	Neg. Neg.	T. B. larynx				
513 M. 19	A D	Far Adv. Improved	111	R.3	L.2	12	Fav. Fav.	Unimp. Unimp.	115	133¼	115	104-76 70-64	98.6 98.6	Neg. Neg.	T. B. larynx	B. E.	1-20000	141	16
514 M. 28	A D	Mod. Adv. Improved	11	R.1	L.2	2	Fav. Fav.	Unimp. Unimp.	135	145	125	96-72 80-64	98.6 98.2	Neg. Neg.	T. B. larynx	B. E.	1-20000	64	12

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban).		Duration in months	General condition	Digestion	Weight.			Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin.			
			Both lungs	Each lung				Admission	Highest San. weight	Normal weight					Variety	Maximum dose-mgs.	Number of days	Number of doses
515 F. 21	A D	Mod. Adv. Improved	11	R.2 L.2		Unfav. Fav.	Unimp. Unimp.	102½	112½	100	86-66 84-72	98.8 98.4	Neg. Neg.	T. B. larynx	B. E.	1-10000	211	29
516 M. 35	A D	Mod. Adv. Improved	11	L.2 R.1	3	Fav. Fav.	Unimp. Unimp.	145	149½	139	84-62 88-68	98.4 98.8	Neg. Neg.					
517 M. 44	A D	Far Adv. Improved	111	R.3 L.2		Unfav. Fav.	Imp. Imp.	132¼	147½		104-64 88-68	98.8 98	Pos. Neg.	Lobar pneum. T. B. larynx				
518 F. 42	A D	Far Adv. Prog.	111	R.3 L.2	24	Unfav. Unfav.	Imp. Imp.				112-80 104-94	99.6 102	Pos. Pos.	T. B. larynx				
519 F. 28	A D	Mod. Adv. Prog.	11	R.2 L.2		Unfav. Unfav.	Imp. Imp.				120-90 120-90	99.4 99.4	Neg. Neg.					
520 F. 29	A D	Far Adv. Died	111	R.3 L.3	17	Unfav.	Unimp.				128-92 104-92	103 97	Pos. Pos.	T. B. larynx				
521 M. 21	A D	Mod. Adv. Improved	11	R.2 L.1	12	Fav. Fav.	Unimp. Unimp.	124	149	148	92-76 84-68	94 94	Pos. Pos.	T. B. larynx	B. E.	1-40000	129	8
522 M. 29	A D	Incipient Arrested	1	R.1 L.1	2	Fav. Fav.	Unimp. Unimp.	117½	143½	135	88-68 76-68	98.4 98.2	Neg. Neg.	T. B. larynx				
523 M. 26	A D	Mod. Adv. Improved	11	R.1 L.2	15	Unfav. Fav.	Unimp. Unimp.	116	139	130	92-74 82-64	98 98.2	Neg. Neg.	T. B. larynx				
524 F. 28	A D	Mod. Adv. Arrested	11	R.1 L.2	24	Fav. Fav.	Unimp. Unimp.	127½	136½	105	106-76 90-80	98 98.6	Pos. Neg.	T. B. larynx	B. E.	1-15000	127	18
525 F. 42	A D	Mod. Adv. Improved	11	R.1 L.1	20	Fav. Fav.	Unimp. Unimp.	132½	138	118	92-64 84-76	98.6 98.4	Neg. Neg.					
526 F. 22	A D	Far Adv. Improved	111	R.1 L.2	24	Unfav. Fav.	Imp. Unimp.	120	134	134	112-94 92-72	98.6 98.2	Pos. Pos.	T. B. larynx				

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527	A	Mod. Adv.	11	R.2	L.1	9	Fav.	Unimp.				92-72	98.2	Neg.					
M. 35	D	Improved					Fav.	Unimp.	167			84-72	98.2	Neg.	T. B. larynx				
528	A	Far Adv.	11	R.1	L.2	4	Fav.	Unimp.			162	96-72	98.8	Pos.					
M. 39	D	Improved					Fav.	Unimp.	162	162		84-74	98.8	Pos.	T. B. larynx				
529	A	Incipient	1	R.1	L.1	12	Fav.	Unimp.			120	88-72	98.8	Neg.					
F. 29	D	Improved					Fav.	Imp.	117	125		72-74	98.8	Neg.	T. B. larynx	B. E.	1-40000	22	4
529a	D	Far Adv.	111	R.3	L.1	24	Unfav.	Unimp.				100-82	99.4	Pos.					
M. 46	D	Improved					Unfav.	Unimp.	139			96-84	99.2	Pos.	T. B. larynx				
529b	A	Far Adv.	111	R.1	L.3	8	Fav.	Unimp.	95½	112½	98	94-84	99	Pos.					
F. 27	D	Improved					Fav.	Unimp.				86-70	98.4	Pos.	T. B. larynv	B. E.	1-15000	208	21
530	A	Far Adv.	111	R.1	L.3	84	Unfav.	Unimp.				96-80	99.4	Pos.					
F. 36	D	Improved					Fav.	Unimp.	145½	150		90-70	99	Pos.	T. B. larynx	B. E.	1-15000	149	15
531	A	Far Adv.	111	R.3	L.3	1	Unfav.	Unimp.			168	96-72	100	Pos.					
M. 26	D	Improved					Fav.	Unimp.		174		96-78	99	Neg.	T. B. larynx				
532	A	Far Adv.	111	L.3	R.2	24	Unfav.	Imp.				116-96	101	Pos.					
F. 43	D	Improved					Unfav.	Imp.				100-84	101.4	Pos.	T. B. larynx				
533	A	Mod. Adv.	111	R.2	L.1	5	Fav.	Unimp.			108	84-60	98.6	Neg.					
F. 37	D	Improved					Fav.	Unimp.	113¼	122½		88-68	98.6	Neg.	T. B. larynx	B. E.	1-40000	22	4
534	A	Far Adv.	111	R.3	L.2	4	Unfav.	Unimp.			115	100-88	99	Pos.					
F. 25	D	Improved					Fav.	Unimp.	115½			112-82	99.4	Pos.	T. B. larynx				
535	A	Far Adv.	111	L.3	R.2	3	Unfav.	Imp.			105	108-82	98.6	Pos.					
F. 38	D	Prog.					Unfav.	Imp.	98½	108½		104-84	100.4	Pos.	T. B. larynx				
536	A	Incipient	1	R.1	L.1	1½	Fav.	Unimp.			180	92-76	98.4	Neg.					
M. 26	D	Improved					Fav.	Unimp.	180½	185		86-72	98.4	Neg.					
537	A	Far Adv.	111	R.3	L.3	13	Unfav.	Imp.			138	104-76	100	Pos.					
M. 27	D	Prog.					Unfav.	Imp.				116-98	100	Pos.	T. B. larynx				
538	A	Mod. Adv.	11	L.2	R.2	6	Fav.	Unimp.			130	106-72	98.6	Pos.					
M. 30	D	Improved					Fav.	Unimp.	119¼	121½		100-74	98.8	Pos.					
539	A	Far Adv.	111	R.2	L.3	6	Fav.	Imp.			150	116-84	99	Pos.					
M. 28	D	Prog.					Unfav.	Imp.	150	150½		100-84	99.2	Pos.	T. B. enteritis				
540	A	Mod. Adv.	11	R.1	L.1	2	Fav.	Unimp.			124	112-92	98.8	Neg.					
M. 22	D	Improved					Fav.	Unimp.	117	136¼		92-76	98.4	Neg.					
541	A	Incipient	1	R.1	L.1	30	Fav.	Unimp.			130	92-64	98.6	Neg.					
F. 29	D	Improved					Fav.	Unimp.	129½	131		80-68	98.2	Neg.					

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp., 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin. Variety	Maximum dose-mgs.	Number of days	Number of doses
542 M. 27	A D	Far Adv. Prog.	III	R.2 L.3		Unfav. Unfav.	Imp. Imp.	122½		128	96-76 92-85	99.8 102	Pos. Neg.	T. B. larynx				
543 F. 22	A D	Far Adv. Prog.	III	R.3 L.2	14	Unfav. Unfav.	Imp. Imp.			127	124-84 110-100	98.6 100.2	Pos. Pos.					
544 F. 30	A D	Incipient Improved	I	R.1 L.1	9	Fav. Fav.	Unimp. Unimp.	119½	127½	130	90-70 84-60	98 98.8	Neg. Neg.					
545 M. 28	A D	Incipient Arrested	I	R.1 L.1	6	Fav. Fav.	Unimp. Unimp.	145	164½	150	88-64 72-62	98 98.4	Neg. Neg.	T. B. larynx				
546 F. 31	A D	Mod. Adv.	II	R.1 L.2		Fav. Fav.	Unimp. Unimp.	114½	137½	130			Neg. Neg.					
547 M. 37	A D	Mod. Adv. Improved	II	R.2 L.1		Fav. Fav.	Unimp. Unimp.	130	159		88-52 88-68	98.8 98.4	Neg. Neg.	T. B. larynx				
548 F. 24	A D	Far Adv. Improved	III	R.3 L.2	32	Fav. Fav.	Unimp. Unimp.				94-80 92-76	99.2 99	Neg. Neg.	T. B. larynx				
549 M. 29	A D	Far Adv. Prog.	III	R.3 L.3	15	Unfav. Unfav.	Imp. Imp.				132-112 140-110	100 101	Neg. Neg.	Diab. mellitus				
550 M. 20	A D	Mod. Adv. Improved	II	R.2 L.2	18	Fav. Fav.	Imp. Imp.	144	150	135	100-80 100-76	98.4 98.8	Pos. Pos.	T. B. larynx				
551 M. 22	A D	Far Adv. Prog.	III	R.2 L.3	7	Unfav. Unfav.	Imp. Imp.				108-80 110-100	101 102	Pos. Pos.					
552 M. 21	A D	Mod. Adv. Improved	II	R.1 L.2	1	Fav. Fav.	Unimp. Unimp.	134	144	133	88-70 84-68	98.4 98.4	Neg. Neg.	T. B. larynx	B. E.	1-20000	29	5
553 M. 35	A D	Far Adv. Improved	III	R.3 L.3	36	Unfav. Fav.	Unimp. Unimp.	139½	154	163	96-72 88-76	99.2 99.2	Pos. Pos.	T. B. larynx				

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554 F. 35	A D	Mod. Adv. Improved	11	R.2	L.1	36	Fav. Fav.	Unimp. Unimp.	108	128	116	100-72 84-72	99.2 99.8	Neg. Pos.	T. B. larynx				
555 M. 64	A D	Mod. Adv. Prog.	11	R.1	L.2	7	Unfav. Unfav.	Imp. Imp.				96-80 100-88	100 99						
556 F. 17	A D	Far Adv. Prog.	111	R.1	L.3	18	Unfav. Unfav.	Imp. Imp.		91	98	112-84 108-88	99 99.8	Pos. Pos.	T. B. larynx				
557 M. 20	A D	Far Adv. Prog.	111	R.2	L.3	4	Unfav. Unfav.	Unimp. Unimp.	111½	117½	125	88-72 94-80	99.4 99.6	Pos. Pos.	T. B. larynx				
558 F. 26	A D	Far Adv. Improved	111	R.2	L.2	24	Unfav. Fav.	Unimp. Unimp.	158	169½	165	98-76 100-88	98.4 98.8	Pos. Pos.	T. B. larynx	B. E.	1-20000	112	14
559 F. 19	A D	Far Adv. Improved	111	R.2	L.3		Unfav. Fav.	Unimp. Unimp.	108½		113	104-88 100-84	98.8 99.2	Pos. Pos.					
560 M. 35	A D	Mod. Adv. Improved	1	R.1	L.1	3	Fav. Fav.	Unimp. Unimp.	154¼	168	155	92-72 94-64	98.6 98.6	Pos. Pos.	T. B. larynx				
561 M. 18	A	Non T. B.										98-68 94-74	98.6 98.6	Neg. Neg.					
562 F. 27	A D	Incipient Improved	1	R.1	L.1	4	Fav. Fav.	Unimp. Unimp.	137	143½	127	112-86 102-90	98.8 98.6	Neg. Neg.					
563 M. 40	A D	Far Adv. Died	111	R.3	L.3	10	Unfav.	Unimp.				112-98 132-96	99.6 100		Pleu. with effu.				
564 M. 27	A D	Mod. Adv. Improved	11	R.1	L.2	3	Fav. Fav.	Unimp. Unimp.	125	141½	135	88-72 84-72	98.6 98.6	Neg. Neg.	T. B. larynx				
565 M. 27	A D	Mod. Adv. Arrested	11	R.2	L.2	12	Fav. Fav.	Unimp. Unimp.	145	150	145	88-72 86-72	98.6 98.6	Neg. Pos.	T. B. larynx				
566 M. 36	A D	Mod. Adv. Arrested	11	R.2	L.2	12	Unfav. Fav.	Unimp. Unimp.	123½	133½		92-76 86-76	98.6 98	Neg. Neg.	T. B. larynx	B. E.	1-20000	43	6
567 F. 27	A D	Far Adv. Prog.	111	R.2	L.3	4 yrs	Unfav. Unfav.	Imp. Imp.				112-88 108-86	99.4 100	Pos. Pos.	T. B. larynx				
568 F. 20	A D	Mod. Adv. Improved	11	R.1	L.2	4	Fav. Fav.	Unimp. Unimp.	132½	141	136	96-68 88-72	98.2 98	Neg. Neg.					
569 F. 36	A D	Far Adv. Improved	111	R.2	L.3	2	Unfav. Unfav.	Unimp. Unimp.	122½	126	129	110-80 92-80	100.6 98.6	Pos. Pos.	T. B. larynx				
570 M. 28	A D	Far Adv. Improved	111	R.3	L.3	15	Unfav. Fav.	Imp. Imp.			125	92-76 94-80	99.6 100	Pos. Pos.	T. B. larynx Fistula in ano	B.			

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp., 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin. Variety	Maximum dose-mgs.	Number of days	Number of doses
571 F. 18	A D	Mod. Adv. Improved	11	R.2 L.2	6	Fav. Fav.	Unimp. Unimp.		117	130	108-80 100-80	98.6 98.6	Neg. Pos.	T. B. larynx				
572 M. 27	A D	Far Adv. Prog.	111	R.3 L.2	2	Unfav. Unfav.	Imp. Imp.	138		145	96-60 106-96	98.8 101.2	Pos. Pos.					
573 F. 24	A D	Far Adv. Improved	111	R.1 L.3	12	Unfav. Unfav.	Unimp. Unimp.	80	86	96	100-82 102-82	98.8 98.8	Neg.	T. B. larynx				
574 M. 30	A D	Mod. Adv. Improved	11	R.2 L.2	6	Fav. Fav.	Imp. Imp.	139		142	100-76 100-86	99.8 99.2	Pos.					
575 M. 19	A D	Far Adv. Improved	111	R.2 L.2	3	Unfav. Fav.	Unimp. Unimp.	112	117	120	92-76 88-76	99.4 98.6	Pos. Pos.	T. B. larynx				
576 M. 14	A D	Far Adv. Died	111	R.3 L.3		Unfav.	Imp.				160-92 116-84	103.2 100	Pos. Pos.	Enteritis T. B. larynx				
577 M. 21	A D	Incipient Arrested	1	R.1 L.1	1	Fav. Fav.	Unimp. Unimp.	169	175¼	165	88-64 92-60	98.6 98.6	Neg. Neg.	T. B. larynx				
578 M. 25	A D	Far Adv. Prog.	111	R.2 L.3	3	Unfav. Unfav.	Imp. Imp.				116-80 104-96	100 100.4	Pos. Pos.	T. B. larynx				
579 M. 32	A D	Incipient Arrested	1	R.1 L.1	2	Fav. Fav.	Unimp. Unimp.	174	199	150	78-60 76-64	98.8 98.6	Neg. Neg.	T. B. larynx				
580 M. 23	A D	Incipient Arrested	1	R.1 L.1	1	Fav. Fav.	Unimp. Unimp.	148½	160	152	86-64 80-68	98.6 98.6	Pos. Neg.					
581 M. —	A D	Mod. Adv. Improved	11	R.1 L.1	24	Unfav. Fav.	Imp. Imp.	133½	135	130	104-72 84-76	99 99	Neg. Neg.	T. B. larynx				
582 M. 38	A D	Incipient Improved	11	R.1 L.2	4	Fav. Fav.	Unimp. Unimp.		145	150	100-90 94-84	99 99	Neg. Neg.	Inter-nephritis				

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583 M. 42	A D	Far Adv. Improved	111	R.3	L.3	24	Unfav. Fav.	Unimp. Unimp.	114½	125	138	102-76 108-82	98.8 98.6	Pos. Pos.	T. B. larynx Pericarditis				
584 M. 24	A D	Mod. Adv. Arrested	11	R.2	L.1	4	Fav. Fav.	Unimp. Unimp.	137½	148	135	76-60 80-64	98.2 98.4	Pos. Neg.	T. B. larynyx				
585 F. 19	A D	Incipient Improved	1	R.1	L.1	4	Fav. Fav.	Unimp. Unimp.	91½	97	110	96-80 88-80	98.6 98.4	Neg. Pos.	T. B. larynyx				
586 F. 43	A D	Mod. Adv. Improved	11	R.2	L.2	36	Fav. Fav.	Imp. Imp.	107¼	111	120	116-88	98.6	Pos. Neg.					
587 F. 27	A D	Mod. Adv. Improved	11	R.2	L.1	2 wks	Unfav. Fav.	Unimp. Unimp.	108½	109	115	88-76 88-80	98.4 98.4	Neg.					
588 F. 41	A D	Far Adv. Prog.	111	R.3	L.2	36	Unfav. Unfav.	Imp. Imp.	149	124¼	140	124-100 106-92	98.8 100	Pos. Pos.	T. B. larynyx				
589 M. 27	A D	Far Adv. Improved	111	R.2	L.2	9	Unfav. Unfav.	Imp. Imp.				104-76 100-80	99 99	Neg.	T. B. larynyx				
590 F. 25	A D	Incipient Arrested	1	R.1	L.1	3	Fav. Fav.	Unimp. Unimp.	115	125½	125	88-68 76-68	98.6 98	Neg. Pos.		B. E.	1-20000	48	5
591 F. 25	A D	Mod. Adv. Improved	11	R.1	L.2	6	Fav. Fav.	Unimp. Unimp.	106	106½	99	88-70 84-74	98.6 99	Neg. Pos.	T. B. larynx				
592 F. 29	A D	Incipient Arrested	1	R.1	L.1	24	Fav. Fav.	Unimp. Unimp.	99¼	106½	100	100-72 86-80	98.6 98.6	Neg. Neg.	T. B. larynx				
593 M. 21	A D	Mod. Adv. Prog.	11	R.1	L.1	3	Fav. Fav.	Unimp. Unimp.	155	160¼	148	120-84 80-72	98.8 98.4	Neg. Pos.	T. B. larynx	B. E.	1-20000	51	8
594 F. 52	A D	Far Adv. Improved	111	R.1	L.3	3	Unfav. Fav.	Imp. Imp.		151	132	100-72 84-76	98.6 98.8	Pos. Pos.	T. B. Larynx				
595 M. 24	A D	Far Adv. Improved	111	R.1	L.3	6	Unfav. Unfav.	Imp. Imp.				116-78 104-84	100.2 99.2	Pos. Pos.	T. B. Larynx				
596 F. 25	A D	Incipient Arrested	1	R.1	L.1	5 yrs	Fav. Fav.	Unimp. Unimp.	96½	107½	92	88-72 80-64	98.6 98.6	Neg. Pos.	T. B. larynx	B. E.	1-10000	126	18
597 F. 25	A D	Mod. Adv. Prog.	11	R.1	L.2		Fav. Fav.	Imp. Imp.	120	117½		92-72 84-68	98.6 98.6	Pos. Pos.	T. B. larynx				
598 M. 25	A D	Mod. Adv. Arrested	11	R.2	L.1	3	Fav. Fav.	Unimp. Unimp.	161	169	150	108-76 88-78	98.6 98	Neg. Pos.	T. B. larynx				
599 M. 25	A D	Mod. Adv. Improved	11	R.1	L.1	12	Unfav. Fav.	Unimp. Unimp.	121½	125½	125	92-72 82-72	99.6 98.6	Pos. Pos.	T. B. larynx Appendicitis				

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin. Variety	Maximum dose-mgs.	Number of days	Number of doses
600 F. 19	A D	Mod. Adv. Improved	II	R.2 L.1	4	Fav. Fav.	Unimp. Unimp.	136½	145½	137	92-72 88-80	99.2 98.6	Pos. Pos.					
601 F. 23	A D	Far Adv. Prog.	III	R.1 L.2	12	Unfav. Unfav.	Imp. Imp.	112½		110	112-84 120-96	99 99	Pos. Pos.	T. B. enteritis T.B. otis media				
602 M. 21	A D	Far Adv. Prog.	III	R.3 L.2	3	Unfav. Unfav.	Unimp. Unimp.			163	124-96 112-92	99.2 99.6	Pos. Pos.	T. B. larynx				
603 F. 32	A D	Mod. Adv. Improved	II	R.1 L.1	2	Fav. Fav.	Unimp. Unimp.		107¼	108	96-80 64-54	98.4 98	Neg. Pos.	T. B. larynx				
604 F. 50	A D	Mod. Adv. Prog.	III	R.3 L.2	29	Unfav. Unfav.	Imp. Imp.	104	111	118	90-76 88-72	99 99.8	Pos. Pos.		B. E.	1-20000	21	4
605 F. 29	A D	Mod. Adv. Improved	II	R.2 L.2	2	Fav. Fav.	Unimp. Unimp.	134	140	130	92-76 80-68	98.8 99	Neg. Pos.	T. B. larynx	B. E.	1-20000	63	9
606 M. 41	A D	Mod. Adv. Arrested	II	R.1 L.2	60	Fav. Fav.	Unimp. Unimp.	148½	172	155	92-60 70-60	98.6 98.4	Pos. Pos.	T. B. larynx				
607 M. 24	A D	Mod. Adv. Improved	II	R.2 L.1	4	Fav. Fav.	Unimp. Unimp.	139	145	135	78-68 80-72	98.4 98.6	Pos. Pos.	T. B. larynx				
608 M. 26	A D	Far Adv. Arrested	III	R.1 L.3	16	Fav. Fav.	Unimp. Unimp.	128	138	130	96-64 76-72	98.6 98.6	Pos. Pos.	T. B. larynx	B. E.	1-15000	48	8
609 M. 34	A D	Mod. Adv. Prog.	II	R.2 L.2	48	Unfav. Unfav.	Unimp. Unimp.				106-80 98-80	99.6 99.8	Pos. Pos.	T. B. larynx				
610 F. 30	A D	Mod. Adv. Improved	II	R.1 L.2	4	Fav. Fav.	Imp. Imp.				100-76 80-72	100 99	Pos. Pos.	T. B. larynx				
611 F. 28	A D	Far Adv. Prog.	III	R.3 L.1		Unfav. Unfav.	Imp. Imp.				128-112 130-112	102 102.2	Pos. Pos.					

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612	A	Mod. Adv.	11	R.1	L.2	6	Fav.	Unimp.			128	116-80	99	Neg.					
F. 24	D	Improved					Fav.	Unimp.	128			112-84	98.6	Pos.					
613	A	Incipient	1	L.1			Fav.	Unimp.				88-68	98.4	Pos.					
M. 35	D	Improved					Fav.	Unimp.				76-90	98.4	Pos.					
614	A	Mod. Adv.	11	R.2	L.1	16	Unfav.	Unimp.				112-78	100.4	Pos.					
M. 34	D	Prog.					Unfav.	Unimp.				106-78	100.8	Pos.					
615	A	Mod. Adv.	11	R.1	L.2	8	Fav.	Imp.				100-68	101	Pos.					
M. 26	D	Prog.					Unfav.	Imp.				108-80	101	Pos.					
616	A	Far Adv.	111	R.3	L.2	5	Unfav.	Imp.				84-96	99.6	Pos.	T.B. lar.& pneu				
M. 20	D	Died					Unfav.					140-134	102	Pos.	Fistula in ano				
617	A	Mod. Adv.	11	R.2	L.2	5	Fav.	Unimp.			145	80-94	98.8	Pos.	Asthma				
M. 40	D	Improved					Fav.	Unimp.	129	145		80-88	98.6	Pos.	T. B. larynx				
618	A	Mod. Adv.	11	R.1	L.2	7	Fav.	Unimp.			112	74-80	98.8	Pos.					
M. 20	D	Improved					Fav.	Unimp.	105	114		79-88	98.4	Pos.	T. B. larynx				
619	A	Mod. Adv.	11	R.2	L.1	8	Fav.	Unimp.			135	74-84	98.2	Pos.					
M. 24	D	Improved					Fav.	Unimp.	126	147		78-72	98.6	Pos.	T. B. larynx	B. E.	1-15000	34	9
620	A	Incipient	1	R.1	L.1	5	Fav.	Unimp.			155	88-100	98.8	Pos.					
M. 25	D	Arrested					Fav.	Unimp.	151	155		72-86	98.6	Neg.	T. B. larynx	B. E.	1-20000	42	7
621	A	Mod. Adv.	11	R.2	L.1	1	Fav.	Unimp.			127	85-108	99	Pos.					
M. 33	D	Improved					Fav.	Unimp.	127	134		82-90	98.6	Neg.					
622	A	Mod. Adv.	11	R.1	L.2	3	Fav.	Unimp.			107	76-88	99	Pos.					
F. 22	D	Improved					Fav.	Unimp.	107	120		84-88	99.2	Neg.		B. E.	1-30000	27	3
623	A	Far Adv.	111	R.1	L.3	17	Unfav.	Unimp.			150	80-96	99.4	Pos.					
M. 30	D	Improved					Fav.	Unimp.		140		72-84	99.2	Pos.	T. B. larynx				
624	A	Incipient	1	R.1	L1	2	Fav.	Unimp.			130	72-88	98	Pos.					
F. 41	D	Improved					Fav.	Unimp.	121	128		64-72	98.6	Pos.					
625	A	Incipient	1	R.1	L.1	2	Fav.	Unimp.			140	72-84	98.4	Neg.					
M. 28	D	Arrested					Fav.	Unimp.	145	154		88-82	98.6	Neg.	T. B. larynx	B. E.	1-10000	35	5
626	A	Incipient	1	R.1	L.1	3	Fav.	Unimp.			98	76-88	98	Neg.					
F. 16	D	Improved					Fav.	Unimp.	110	113		76-84	98.6	Neg.					
627	A	Mod. Adv.	11	R.2	L.1	5	Fav.	Unimp.			145	70-80	98.6	Pos.					
M. 34	D	Arrested					Fav.	Unimp.	133	142½		72-78	98.6	Pos.					
628	A	Far Adv.	111	R.1	L.3	4	Unfav.	Imp.			112	100-94	100	Pos.					
F. 28	D	Prog.					Unfav.	Unimp.				88-100	99.4	Pos.	T. B. larynx				

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TABLE VII—CONTINUED.

No., Sex, Age		CONDITION	Extent of Physical Signs (Turban). Both lungs	Each lung	Duration in months	General condition	Digestion	Weight. Admission	Highest San. weight	Normal weight	Pulse: Ten days' admission; five days' discharge	Avg. Max. Temp. 10 days' adm.; 5 days' discharge	Tubercle bacilli	Complications	Tuberculin. Variety	Maximum dose-mgs.	Number of days	Number of doses
629	A	Far Adv.	111	R.1 L.1	14	Unfav.	Unimp.			135	108-96	99.6	Pos.					
F. 35	D	Improved				Fav.	Unimp.		119		116-90	99.4	Pos.	T. B. larynx				
630	A	Mod. Adv.	11	R.1 L.1	13	Unfav.	Imp.			118	92-80	100	Pos.	T. B. larynx				
F. 39	D	Died						85			114-96	101	Pos.	T. B. larynx				
631	A	Far Adv.	111	R.2 L.2	24	Unfav.	Unimp.				100-88	99.2	Pos.					
M. 23	D	Died						137	134		110-98	97.4	Pos.					
632	A	Far Adv.	111	R.3 L.3	24	Unfav.	Unimp.			100	116-100	100	Pos.					
F. 36	D	Improved				Fav.	Unimp.	83	85		102-118	100.8	Pos.					
633	A	Mod. Adv.	11	R.2 L.1	4½	Fav.	Unimp.			185	110-96	100	Pos.	Fistula in ano				
M. 33	D	Improved				Fav.	Unimp.	151	163		88-96	98.8	Pos.					
634	A	Mod. Adv.	11	R.1 L.2	12	Fav.	Unimp.			140	100-132	102	Pos.					
M. 27	D	Improved				Fav.	Unimp.	132	132		82-96	99	Pos.	Pleural effusion				
635	A	Mod. Adv.	11	R.2 L.1	360	Fav.	Unimp.			144	82-72	98.2	Pos.					
M. 50	D	Arrested				Fav.	Unimp.	145	159		64-70	98.6	Neg.	Chron. appendix				
636	A	Incipient	1	R.1 L.1	6	Fav.	Unimp.			125	88-72	98.4	Pos.					
M. 22	D	Arrested				Fav.	Unimp.	125	130		76-88	99.2	Neg.					

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APPENDIX EIGHT.

General Financial Summary and Detailed Disbursements, General Account.

GENERAL FINANCIAL SUMMARY.

1911 and 1912	October	November	December	January	February	March	April	May	June	July	August	September	Total
Salaries	$1,131 62	$1,131 62	$1,131 62	$1,141 62	$ 878 77	$ 595 73	$1,147 46	$1,147 46	$1,226 63	$1,197 46	$1,199 96	$1,202 46	$13,132 41
Traveling expenses	175 00	75 00	300 00	50 00	----------	250 00	150 00	220 95	450 00	281 63	435 00	346 50	2,734 08
Bulletin	----------	19 96	300 50	178 88	----------	489 98	20 00	41 50	69 80	702 96	991 14	224 96	3,039 63
Board of Health	----------	----------	----------	425 80	----------	345 00	40 40	278 80	----------	417 00	----------	67 60	1,574 60
Laboratory	12 05	62 16	22 90	40 41	----------	20 35	28 10	78 91	34 34	30 27	258 98	6 80	590 27
Virus	----------	140 98	----------	----------	----------	178 75	52 00	48 75	----------	169 00	84 50	----------	673 98
General expenses	261 33	595 26	553 16	263 72	195 05	404 91	226 80	306 63	518 99	2,497 60	609 48	533 83	6,966 76
Vital statistics	----------	----------	----------	----------	----------	----------	58 70	----------	550 11	1,315 69	642 46	376 98	2,943 89
Total	$1,580 00	$2,024 98	$2,308 18	$2,100 43	$1,073 82	$2,284 67	$1,723 46	$2,123 00	$2,849 87	$6,611 61	$4,216 52	$2,759 08	$31,655 62

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APPENDIX NINE

Financial Statement of the Catawba Sanatorium.

SUPPORT ACCOUNT.

Receipts.

Oct.	1	Balance	$ ---
		Patients' board	28,809 17
		Transportation	1,212 00
		Appropriations	37,500 00
		Transients' board	624 50
		Telegrams	49 73
		Hospital supplies	218 72
		Telephone messages	49 10
		Farm supplies	772 21
		Groceries and provisions	587 28
		Express collections	58 53
		Coal sales	21 07
		Construction (material)	1 00
		Drugs	1 75
		Employees wages (credit)	20 40
		Equipment	14 25
		Endowment bed	50 00
		Freight (patients)	7 00
		Farm equipment	4 00
		Meats, fresh	101 29
		Office expense (credit)	3 60
		Repairs to buildings (material)	2 00
		Rent	20 00
		Special nursing (collections)	441 92
		Insurance	3,100 00
		Total receipts	$ 73,669 52

Disbursements.

Attendants' wages	$ 1,877 02
Account loan (State Board of Health)	2,500 00
Blacksmith	184 78
Board walks	37 69
Coal	1,392 77
Construction	2,003 95
Dining room wages	2,073 09
Doctors' manager and clerks' salaries	5,331 49
Drugs	1,048 82
Employees' wages	2,622 53
Express	148 90
Examination of applicants	289 00
Equipment	1,952 86
Farm and stable wages	1,458 20
Freight	808 64
Farm equipment	1,280 31
Fertilizer	464 50
Fences	58 27
Farm supplies	1,419 05
Groceries and provisions	12,305 96
Garden wages	390 00

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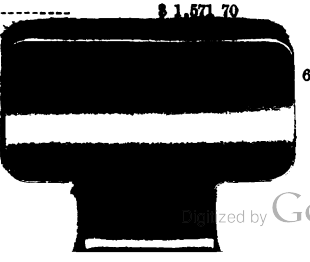
Garden supplies	$ 161 59
Grounds	258 73
Hauling	2,115 64
Hospital supplies	1,608 79
Hospital equipment	499 23
Insurance	236 50
Ice	298 33
Kitchen and bakeshop wages	2,234 52
Laundry	892 64
Meats, fresh	6,212 05
Meats, salt	175 27
Meats, smoked	720 71
Milk	3,945 15
Matron and maids' salaries	1,240 88
Nurses' wages	3,800 04
New buildings	1,718 22
Oil	513 37
Office expense	418 67
Office equipment	409 75
Painting	399 36
Postage	211 50
Printing	310 83
Repairs to plumbing and heating	169 94
Repairs to buildings	139 56
Repairs and replacement of kitchen equipment	230 44
Renewals of crockery and glassware	89 71
Refund board	908 43
Repairs to equipment	5 80
Roads	320 93
Sewerage and water	1,029 90
Special nurses	590 49
Screen doors and windows	59 19
Telegrams	145 97
Travel and expense	357 55
Telephones	396 65
Wood	35 50
Total disbursements	$ 72,504 68
Total receipts	$ 73,669 52
Total disbursements	72,504 68
Balance in the Bank of Salem	$ 1,164 84

STATEMENT OF COST.

Attendants' wages		$ 1,877 09
Account loan from State Board of Health		2,500 00
Blacksmith		184 78
Board walks		37 69
Coal—Inventory September 30, 1911	$ 200 00	
Purchases	1,392 77	
Total	$ 1,592 77	
Less cash sales	21 07	
Balance	$ 1,571 70	
Less inventory September 30, 1912		
Net balance		688 70



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Construction			$ 2,003 95
Dining room wages			2,073 09
Doctors', manager and clerks' salaries			5,331 49
Drugs—Inventory September 30, 1911		$ 175 00	
Purchases		1,048 82	
Total		$ 1,223 82	
Less cash sales		1 75	
Balance		$ 1,222 07	
Less inventory September 30, 1912		150 00	
Net balance			1,072 07
Employees' wages		$ 2,622 58	
Less credit		20 40	
Net balance			2 602 18
Express		$ 148 90	
Less cash collections		58 58	
Net balance			90 37
Examination of applicants			289 00
Equipment			1,952 86
Farm and stable wages			1,458 20
Freight		$ 803 64	
Less cash collections		7 00	
Net balance			796 64
Farm equipment			1,280 31
Fertilizer			464 50
Fences			58 27
Farm supplies—Inventory September 30, 1911		$ 1,250 00	
Purchases		1,419 05	
Total		$ 2,669 05	
Less cash sales		772 21	
Balance		$ 1,896 84	
Less inventory September 30, 1912—			
Hay, oats, corn and straw	$515 20		
Potatoes and apples	250 00		
9 Sows	195 00		
36 Hogs	630 00		
53 Shoats	159 00		
		1,749 20	
Net balance			147 64
Groceries and provisions—Inventory September 30, 1911		$ 269 41	
Purchases		12,305 96	
Balance		$12,575 37	
Less cash sales	$587 28		
Less transients board	624 50		
Less inventory September 30, 1912	652 04		
		1,863 82	
			10,711 55
Garden wages			390 00
Garden supplies			161 59
Grounds			259 73

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Hauling		$ 2,115 64	
Less transportation—Transients and patients		1,212 00	
Balance		$ 903 64	
Less coal hauling charged prior to September 30, 1912, but credit taken as per inventory coal on hand September 30, 1912		455 00	
Net balance			$ 448 64
Hospital supplies—Inventory September 30, 1911		$ 84 00	
Purchases		1,608 79	
Total		$ 1,692 79	
Less cash sales	$218 72		
Less inventory September 30, 1912	109 33		
		328 05	
			1,364 74
Hospital equipment			499 23
Insurance		$ 236 50	
Less unearned insurance		220 74	
Net balance			15 76
Ice			298 33
Kitchen and bakeshop wages			2,234 52
Laundry			892 64
Meats, fresh		$ 6,212 05	
Less cash sales		101 29	
Net balance			6,110 76
Meats, salt			175 27
Meats, smoked			720 71
Milk			3,945 15
Matron and maids' salaries			1,240 88
Nurses' wages			3,800 04
New buildings			1,718 22
Oil			513 37
Office expense		$ 418 67	
Less cash collections		3 60	
Net balance			415 07
Office equipment			409 75
Painting			399 36
Postage			211 50
Printing		$ 310 83	
Less inventory		75 00	
Net balance			235 83
Repairs plumbing and heating			169 94
Repairs to buildings			139 58
Repairs and replacement of kitchen equipment			230 44
Renewals of crockery and glassware			89 71
Refund board			908 43
Repairs to equipment			5 80
Roads			320 93
Sewerage and water			1,029 90
Special nurses		$ 590 49	
Less cash collections		441 92	
Net balance			148 57

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Screen doors and windows		$ 59 19
Telegrams	$ 145 97	
Less cash collections	49 73	
Net balance		96 24
Travel and expense		357 55
Telephones	$ 396 65	
Less Cash Collections	49 10	
Net balance		347 55
Wood		35 50
Total		$66,019 68
Less refund to State Board of Health (loan)	$ 2,500 00	
Less refund to patients for unearned board	908 43	
Less expenditure for new buildings	1,718 22	
Less expenditure for sewerage and water	1,029 90	
		6,156 55
Net expenditure		$59,863 13

With a daily average of 107 patients, thus showing the cost to be $1.528 per day, or $10.69 per week.

COMPARATIVE STATEMENT OF COST.

Gaylord Farm Sanatorium (Conn.)	Capacity	76	$ 1 77
Jewish Consumptives' Relief Hospital (Col.)	"	110	1 60
Maine Sanatorium (Maine)	"	100	1 76
Adirondack Cottage Sanatorium (New York)	"	110	1 68
The Michigan State Sanatorium (Michigan)	"	50	1 76
State Sanatorium for Consumptives (Minnesota)	"	90	1 65
New Jersey Sanatorium for Tuberculosis (N. J.)	"	175	2 00
Wisconsin State Tuberculosis Sanatorium (Wis.)	"	130	1 80
Total			$14 02
Average			1 75
Catawba Sanatorium (Virginia)	"	115	1 58

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BETTERMENTS ACCOUNT.

Receipts.

March	1	Appropriation	$ 50,000 00
July	25	State Board of Health	1,500 00
		State Board of Health	1,775 00
		Total	$ 53,275 00

Drafts on Auditor.

April	15		$ 8,333 33	
Sept.	27		5,000 00	
				13,333 33
Sept.	30	Balance in Auditor's office		$ 39,941 67
Sept.	30	Total deposits (Bank of Salem)	$16,608 33	
Sept.	30	Total disbursements	11,338 32	
Sept.	30	Balance (Bank of Salem)		5,270 01
Sept.	30	Total balance		$ 45,211 68

Disbursements.

April	20	1	C. D. Denit, clerk, recording deed	$ 3 15
		2	C. B. Strickler, real estate	3,275 00
		3	Bowman & Bowman, legal services	81 40
	22	4	E. G. Williams, real estate	3,500 00
Sept.	7	5	G. S. Morgan, new building	250 00
	19	6	Chas. M. Robinson, architect fees	886 37
	20	7	The Ledger-Dispatch, advertising	16 00
		8	The News, advertising	13 75
		9	Virginian and Pilot Publishing Company, advertising	10 50
		10	Richmond Evening Journal, advertising	8 40
		11	World Printing Company, advertising	5 00
		12	Advance Newspaper Company, advertising	13 75
	26	13	Auditor Public Accounts, refund	1,775 00
		14	Auditor Public Accounts, refund	1,500 00
			Total disbursements	$ 11,338 32

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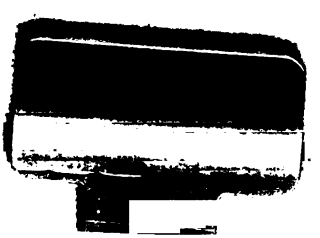

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